Gleanings in Bee Culture

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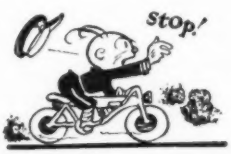

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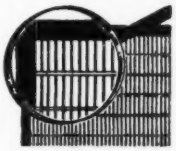

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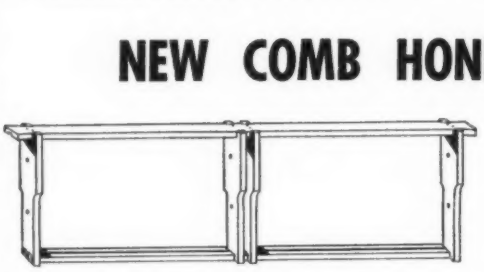

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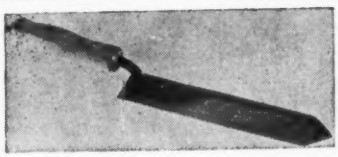

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The use of pollen supplement and substitute

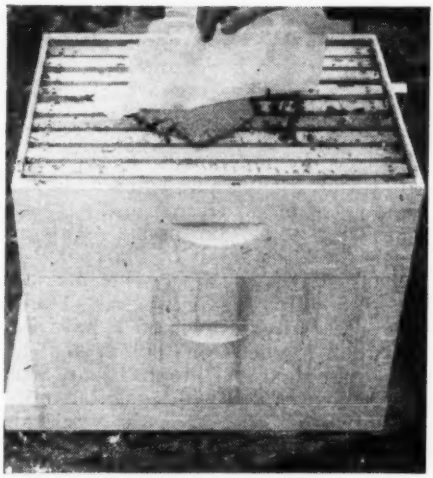
W. A. STEPHEN, North Carolina Extension Beekeeper

THE WORK of Dr. C. L. Farrar has drawn attention to the fact that pollen is not in sufficient supply in many colonies to meet their needs in brood rearing. Some beekeeping authorities have spoken of pollen-clogged combs. These may occur in limited sections at certain times of the year, but when bees are kept in areas where vast acreages are devoted to cultivated crops there are times when there is not sufficient natural pollen to supply the needs of the colonies.

If one accepts the statement that one cell of pollen and one cell of honey is essential for the rearing of one bee, it becomes obvious that pollen-clogged combs are a boon in colony build-up. At the height of brood rearing one such comb would only be sufficient to last a colony about three days, or two might meet the requirements of the colony for a week.

This seems to be beyond our comprehension so in order to give basis for our conclusions, let us suppose that a queen is laying 2,000 eggs a day. Before these bees mature each will have required a cell of pollen. In three days' time the queen will have laid enough eggs to practically fill one Langstroth comb. Thus a comb of pollen will be required for the bees raised from eggs laid by the queen during a three-day period. Roughly, it figures out to be 200 bees for one ounce of pollen or 10 ounces of pollen for each day's laying on the part of a good queen. Since a queen laying at the rate of 2,000 eggs a day will keep only about seven combs full of brood it goes without saying that queens that keep 12 or more combs full of brood will have colonies whose pollen requirements are proportionately greater.

Even in areas where there are plenty of natural sources of pollen and as old beekeepers say, "My bees tote bread every month in the year", there are many periods of shortage. It is questionable just how small a break in brood rearing is discernable but evidence of lack of pollen can only be obtained "by seeing the pollen not there", and by observing the brood pattern.



Pollen supplement or substitute cakes must be placed where the bees can get this stimulative feed.

On occasion I have seen a large amount of older, sealed brood in the hive, plenty of eggs, but only an equal area filled with young brood, mostly under three days of age. It was obvious that something had interrupted the pattern of continuity. This could have happened by the removal of the queen for a three-day period but more than likely that the nurse bees had been deprived of their "bread" for a few days with resulting failure in "nursing" the brood.

IN A well-balanced brood nest the ratio of area filled with eggs compared with that occupied by young unsealed brood and that with sealed brood will be as 1: 2: 4. This is because each bee is twice as long in the larval stage as in the egg and twice as long in the pupal stage as in the larval or grub

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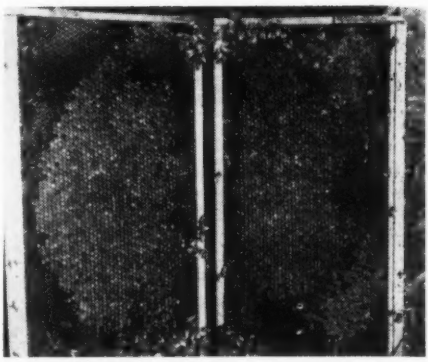
stage. It is the daily ratio of 3: 6: 12, from the life history table.

It is during the larval stage that "nursing" takes place. The nurse bees consume pollen (a source of protein) and honey (a source of carbohydrate) and their head glands secrete royal jelly which is pumped into the cell along with the young larva down in the bottom.

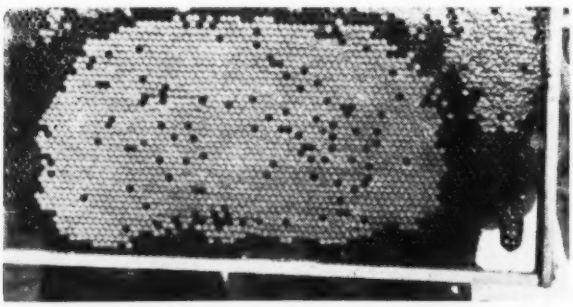
In order that these glands may function properly, a large amount of pollen is consumed. The nurse bee can live on honey alone and may even secrete some royal jelly at the expense of nitrogenous compounds in her own body, but, if any, there will be a limited amount of brood rearing in any colony subsisting solely on honey. This reveals the basic needs of the colony on which studies dealing with nutrition vs. brood rearing are based. During the past fall and winter I have had occasion to check one colony that has had continuously 10 to 20 square inches of comb filled with eggs, but never any larvae. The colony is weak and completely devoid of pollen.

In general practice today the lack of pollen is supplied by either a supplement or a substitute. While supplements and substitutes may be fed in the dry form, simply setting out trays of the materials where they are available for the bees to gather, the same inclemencies that may prevent "toting" of pollen will also prevent the collecting of the supplement or substitute. The supplement has pollen as a prime ingredient. Pollen is trapped from cer-

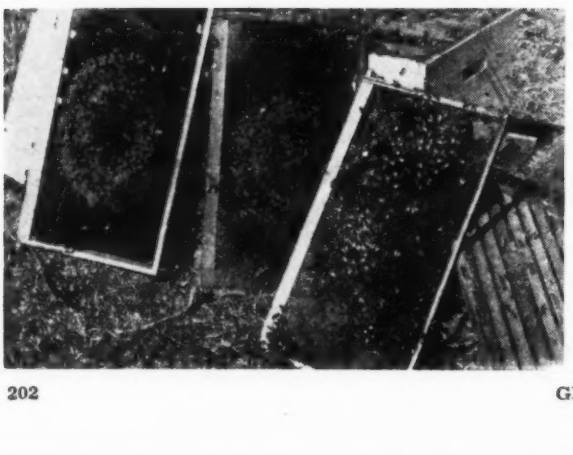
(Continued on page 250)



Combs of surplus pollen are a boon. In raising the bees in a colony headed by a good queen this pollen would not last a week.



Good quality brood may indicate a good queen, but there must be plenty of pollen on hand, too.



Brood pattern shows definite signs of pollen deficiency.

Finding and replacing queens

S. JOAQUIN WATKINS, Fruita, Colorado

THE PROBLEM of whether to replace a queen or not is a perplexing one at times because not only is the colony morale disturbed during replacement, but a good queen may possibly be replaced by an inferior one. The old axiom which said that any young queen is better than an old queen is not always true. Many two-year-old queens and probably some three-year-old queens produce superior colonies.

In evaluating a queen several things are taken into consideration, such as her age (if known), general appearance, her brood pattern, amount of brood, desirability of the stock, and comparative strength with other colonies of the same yard. Other factors to be considered in judging her performance are available honey and pollen supplies (both in the field and stored surplus), strain of bees (some strains breed up much faster and earlier than others), and location.

One has to be careful to condemn or praise the queens of a particular yard because a good or bad location influences performance quite materially, particularly in the early spring. The available pollen and nectar sources as well as climatic conditions can vary considerably within a short distance.

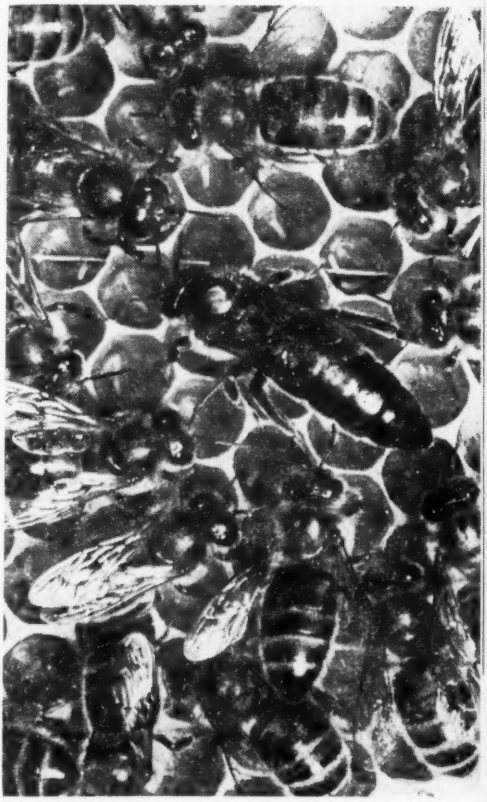


Photo by Harold Doering, Germany.

Be sure that queens are not killed without evaluating them carefully because in many areas many queens are superceded in the late fall or early spring and colonies headed by these queens are inclined to give good results.

In the early spring inspection it is a good practice to evaluate the strength of a colony and mark it according to the grade, those marked No. 1 being those needing future attention to prevent swarming, No. 2 being normal, queen-right colonies, and those marked No. 3 are those below standard which in most cases need new queens. Also, in some cases those of No. 1 and No. 2 strength may have a failing queen in which case they are marked for replacement. The queen in this instance may be one which though heading a populous colony, is showing signs of age, poor viability of the brood, or signs of turning into a drone layer. By having the colonies marked beforehand, much time is saved when the queens arrive. Time can be very precious with a quantity of queens to introduce and the weather stormy.

In finding the queen in case of a double brood chamber give a quick look at one or two of the center combs in the top brood chamber and then if not found set it off on the lid, or immediately set it off to prevent the queen from running below. There seems to be a tendency for the queen to be above, especially in the morning which seems to be, for some reason, the best

time of the day during which to find the queen. Start at the center of the hive and work toward either side (I can't decide which is better, to work toward or away from the looker), care being taken to handle the combs carefully and with the use of as little smoke as possible to keep the bees from being unduly disturbed. Give a quick and systematic glance at both sides of the comb and a hasty glance at the exposed part of the next comb because she tends in many cases to run ahead of the looker. If not found, set the comb end up against the side of the hive body.

IN CASE of cold weather or the inclination of the bees to rob, the combs as examined are placed in an extra hive body provided for the purpose. After all the combs are removed and the queen is still unfound, a careful look is given to the walls of the hive since a nervous queen will try to hide. Also, Caucasian queens are more inclined to hide than Italians.

If still not located, each comb is very carefully checked again and returned to the original hive body. Usually by this time the bees are inclined to gather in large groups and should be separated by shaking them gently into the hive (the queen is inclined to adhere to the comb) or by blowing on them or smoking them. If all this fails and she must be located, shake the bees over a hive body through a super which has a queen excluder nailed on the bottom.

This later method is particularly valuable in finding drone-laying queens. If laying workers are suspected, shake the bees some distance from the hive and the bees will return and the laying workers will not.

After the orange flow in California we find a higher percentage of populous colonies either queenless or with drone layers than is normal. We practice taking a laying queen and two frames of brood and bees and putting these in the queenless or drone-laying colony, the caged queen being placed in the colony from which the queen and brood have been removed. This gives two good colonies, as a rule, especially if there is a honey flow during introduction, instead of one good one, plus one which has to start from scratch in building up.

In Colorado since we operate primarily for comb honey, more care in the replacement of queens is necessary. Since new queens are less inclined to swarm, we replace the older ones more freely.

For introduction the regular shipping cage is used and is quite successful if there is any honey flow at all. If no nectar flow, I think that perhaps one of the other introduction methods would be superior. That is a matter of individual preference.

It's An Idea

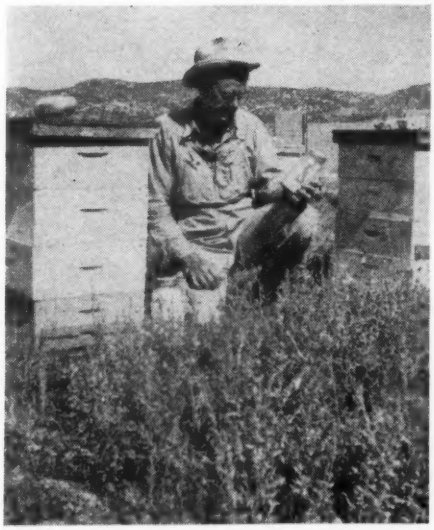
"Handy and Easy to Build"

MILTON H. STRICKER, Annandale, N. J.

ORIGINALLY BUILT to wheel two colonies from muddy orchards when a truck could not get to them, this simple lift truck has been found useful in moving supers, nuc boxes, and all manner of things around the apiary. It is made of half-inch pipe with an axle running through a centrally located piece of pipe with wheels on either end—a very simple matter to make of scrap pipe, especially if you have a set of pipe dies. No unions are necessary if the pipe is threaded two inches long on one end and this end screwed into the joint and backed off into the joint on the opposite side.

Vet-Strep and TM-10 in controlling European foulbrood

JOHN W. HOLZBERLEIN, JR., Meeker, Colorado



Mr. Holzberlein looks at the jar that kept him in business.

NOW THAT we have completed our second year of controlling European foulbrood with antibiotics it may be in order to record our experiences. The results have been so satisfactory over such a wide period and under such a variety of conditions that we feel safe in recommending our practices to anyone having trouble with EFB.

While the causative organism is still the same, **Bacillus pluton,** it seems to behave differently than it did 20 to 30 years ago when most of the literature was published on this disease. It seems to develop more rapidly. It attacks and completely ruins the largest of colonies. And the dequeening and requeening method that was effective in those days seems to be of little value in controlling the EFB we see today. It was fast reducing our colonies to the point where little surplus honey was being stored. It seemed to appear in ever-increasing waves until each year we had fewer colonies, and continually bought more package bees to keep up our numbers. The answer came just in time.

The treatments we have found effective are so numerous that it almost becomes confusing. We have used both streptomycin and terramycin, the first in two forms, the second in three. All gave good results. But there is a difference in the costs and the ease of application, and for that reason we have settled on streptomycin for use in liquid feed and terramycin in a dust.

Streptomycin Quicker Acting—More Stable in Liquid

Streptomycin can be most economically purchased in the Vet-Strep form. As its name implies it is put up for veterinary use and can be purchased from most veterinarians. In this form it is only one-third active material, but this is readily computed and really makes for more accurate measuring of dosages than when a more concentrated form is used. We have found streptomycin to give the fastest results in treating a colony where EFB was already present. It is also reported to be more stable than terramycin when mixed with liquid which makes it preferred for use in feeding syrup. A considerable saving is made by purchasing in the large size containers where one expects to use a quantity.

Various dosages have been recommended, but we have found that where a gallon of syrup is to be fed to a colony at one time that one-sixth gram to the gallon gives good results. Where it is used as a spray or sprinkling syrup we use one-half gram per gallon since the colony gets much less of the mixture at a treatment.

Low Cost and Convenience of Using TM-10

THE PAST year most of our treatment was preventive. The main objective was to cover a large number of colonies with the minimum of time and expense, yet give each colony a treatment that would prevent or check any inroad of disease. J. O. Moffett of Colorado A & M College had reported the successful use of TM-10 in a dust in preventing EFB so we tried it with all those colonies not requiring supple-

mental feeding during the spring of 1954. We used one part of TM-10 to three parts of powdered sugar mixed thoroughly with a flour sifter. After mixing it was put into five pound honey jars with 25 or 30 holes of about 3/32 inch diameter punched into the lid. This works like a large salt shaker. Enough can be mixed up for a whole day's use and solid lids placed on all except the jar to be used first. This prevents the mixture from becoming damp and clogging the shaker holes.

We try to apply about a full teaspoonful to an average size colony. It is best applied right on the bees on the top bars of the lower body of a two story colony. This puts it in about the center of the cluster. Quite a lot sifts down onto the bees between the combs, but none is wasted as it is eagerly licked up, and we believe passed around among the bees.

If not much other work is being done, and yards are reasonably close together, two men can dust about 200 colonies in a day. When it appears that a colony is diseased (this can soon be detected without separating the combs) we apply more of the dust, dusting "up" into the second body by inverting it and finally applying dust to the top of the upper combs as well. One man manipulates the colony, the other man uses the smoke and the dust jar, holding it in one hand and hitting the bottom with the heel of his hand. We try to give three dustings, beginning before the disease is likely to appear. Approximately 10-day intervals have been often enough so far. This finishes the work before the main honey flow begins. When a colony enters a honey flow without EFB it is not likely to contract the disease as many colonies temporarily clean up this disease during a good honey flow without any treatment. The trouble with the honey-flow clean-up is that their strength is lowered to the point where little honey is stored.

Applying dust to package bees for prevention of EFB.

We still believe that the brood of young queens is more hardy and less likely to contract this disease, but we have discovered no strain of bees with enough resistance to make their use practical in diseased areas without the use of the above-mentioned treatments.

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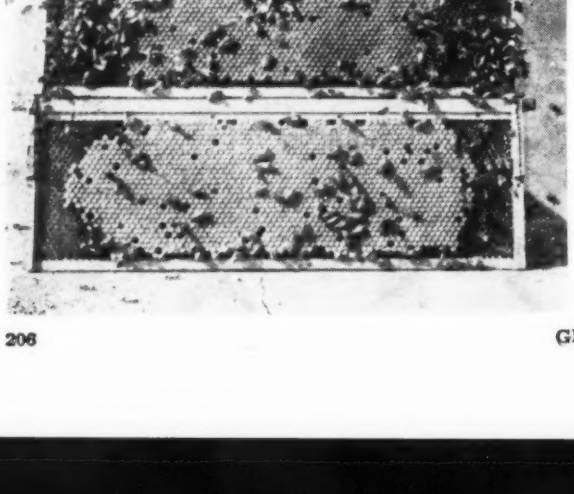

Much more brood like this when TM-10 is used.

More about handling bees

DAVID BONE, Kent, England

GREAT CARE should be taken in withdrawing each frame, so that no bees are crushed or rubbed between the side-bars and the wall of the hive. As in driving a car through a gateway, if you keep a sharp eye on one side, the other will take care of itself.

As far as possible, hold each frame over the hive while you examine it. Newly-born bees are constantly falling helpless from the comb, particularly if there is a breeze blowing; and you may find dozens of them in the grass round a stock that has just been examined. They seem quite unable to crawl back to safety, and very soon become numb and motionless even in mild weather. Newly stored pollen and nectar fall from the cells of brood combs very much more than is generally believed, when the frames are being manipulated. In summer, quite a hail of pollen pellets will sometimes fall from a brood comb if it is held horizontally; and these hard-earned commodities might as well fall back into the hive, so that the bees may gather them up if they think fit.

For these reasons, too, I still adhere as much as possible to the old rule that frames ought not to be held horizontally, but, even in turning them, always kept upright. But this rule originated for a different reason, which need not detain us here.

The second frame should be carefully replaced in the hive, close up to the side wall. The third frame is then withdrawn and examined, and replaced close up against the second, and so on, until the last frame has been inspected and returned to the hive. There will now be room for one frame more. Those already replaced in the hive should be squeezed together as tightly as possible; and what was originally the first frame is now put back last of all, and pressed up close to the others, so that the margin of free space in the brood-box now lies on the opposite side to what it did originally.

In replacing frames, take great care not to crush bees between the edges of the Hoffman spacers when pushing one frame up to the next before it. A little smoke may be necessary to drive the bees out of harm's way.

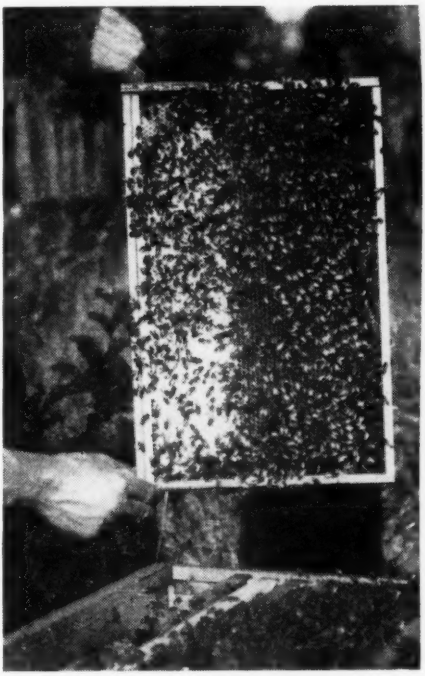

Fig. 1. Turning a frame in order to inspect the other side of the comb. The frame is being swung round like a door towards the camera, with the new side now visible. It will be held upside down for inspection of this side, and then turned back as it was by reversing the process.

The spurs of brace comb that are often built between the top-bars of two adjacent frames are often a nuisance in this respect. Bees are liable to be crushed between the broken halves of the brace comb when the two frames are being brought together again; and a puff of smoke may be necessary. Furthermore, these jagged outstanding spurs of wax may rasp and abrade the face of the neighboring comb while it is being lifted or replaced; and, as far as is convenient, they should be removed as you go along.

Unless you have a definite reason for transposing a frame, all except the first and the last should be replaced in exactly the same relative position as

XUM

you found them in—in the same order, and the same way round.

It is not always necessary to inspect every frame in the hive. You may, for instance, be looking for the queen, and find her on the second frame. In such cases, if you find you do not have to examine more than half of the frames, it is easier to conclude by pushing those that have been inspected back into their original positions, finally replacing the first frame where you found it.

Now suppose you merely want to examine the middle frame of the colony—say, for the presence of eggs. It is still just as well to remove the first frame from the hive, so as to provide ample room. With your hive tool, lever back the next few frames, either singly or in pairs, into the space so formed, until you come to the comb you wish to inspect. Afterwards, the intervening frames are pushed back into position without having been removed from the hive at all.

In all manipulations, be very careful where you put your fingers, and even how you close your hand, for there are bees everywhere, and they will even fly into your hand while you close it, inviting you, as it seems, to crush them and be stung in return. I think the propolis on the fingers attracts them, for when your hands get covered with it, the bees will always be running in and out of them in a most inquisitive and inconvenient manner, even when you are merely standing near the hives.

Fig. 2. Inspecting the fourth frame. Frames two and three have been pressed close to the near side of the hive.

IN REPLACING supers or inner cover, first drive the bees down with a few puffs of smoke, then place one side of the super or cover in position on the hive, and gently and very slowly lower it down so that any bees that are in the way may have an opportunity to withdraw. A puff of smoke blown through the narrowing gap will also encourage the retreat of any bees who may be sticking their necks out. Bees are very slow to take the hint, and it is sadly easy to crush them while trying to avoid it. But some beekeepers do not try very hard.

A friend was once telling me of the carelessness of a beekeeping specialist, whose demonstration he had just attended. His description of the man's replacing a super on the hive reminded me of that passage in Scripture about "the crackling of thorns under a pot". In this case the unpleasant noise was not the laughter of a fool, but the crushing of the poor bees who were not quick enough to get out of the man's way. One might have illustrated the scriptural phrase about "the quick and the dead" by saying that the quick were those who got out of his way, and the dead were those who didn't. So don't crush bees.

Here I can impart a useful tip. However slowly you lower down a super or inner cover when replacing it on a hive, you are still liable to crush a few bees. They are so slow to move out of harm's way that they find themselves wedged in the slowly closing aperture and unable to wriggle out. If now you raise the super again for a fraction of an inch, once or twice, before finally letting it go, these bees, who would otherwise get squashed, can get back to safety. Therefore it is always a good plan to make a slight withdrawing movement just before finally letting a

super or suchlike sink down on to the hive; and a similar sort of movement serves well when bees get caught between the spacers of two frames that you are bringing together.

Bees seem to have no conception of the danger of getting crushed, for squeezing and pressing and jostling is the order of the day in the beehive; and they are slow to take it as a warning. We cannot blame them for this, although it sometimes seems like an annoying stupidity.

As I have said, bees may be dislodged from a comb by shaking it briskly. But for my part, I do not like to be too vigorous in shaking frames that are heavy with honey or brood. Queen cells are liable to be damaged by shaking. If you shake, take hold of the frame firmly, preferably by the Hoffmann spacing edges of the sidebar, and be careful not to crash it down on the hive while shaking.

Bees may also be brushed or swept off combs or hive parts with a tuft of grass, a supple leafy twig or spray from some shrub, or with a stiff feather. Special soft bee brushes often entangle and irritate the bees, and, for my part, I never use them.

Fig. 3. Space being provided, any comb in the brood nest may be withdrawn for inspection by simply easing back the intervening frames to make enough room to prise the chosen one free from its attachments of propolis.

If when you open the hive, a dozen or so bees suddenly fly up at you, like a squadron of fighter aircraft taking off to intercept an enemy, darting and hovering in front of your face with an aggressive high-pitched whining note, then you may prepare for trouble. Bees do not normally behave like this, and if you persist in troubling them, they may further your culture by teaching you how well the Psalmist expressed himself when he said of his enemies, "They came about me like bees."

Swarms are supposed to be singularly docile and good-tempered; and ever since the days of the great Wildman, there have been persons whose strange ambition it is to be seen and admired with a swarm clinging about their faces like a beard, or round their naked chests like a vest. The invention of photography gave great impetus to these unpleasant performances, whose point I could never appreciate. But swarms are not always so good-humored, and I would advise the beginner to wait a year or two before he is photographed with one around his neck. For myself, I have very frequently been stung while taking even the easiest swarms—and taking them with the utmost care and gentleness. The beginner should wear a veil for this operation.

For dealing with excessively bad-tempered colonies, some of the books give the following recipe: Close the hive up, and bang loudly on the sides of it with a heavy stick, in order to terrify and subdue the bees, who think the end of all things is at hand. I once found myself up against an ungovernably angry colony, and determined to try this method. The bees had lost all patience with me; and I

(Continued on page 252)

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Adding life to bee equipment through wood preservatives

DR. E. J. DYCE, Cornell University, Ithaca, N. Y.

EACH YEAR large quantities of valuable bee equipment are needlessly left to the ravages of the weather and resulting damage from fungi, insects, and other organisms. The life of hive stands, bottom boards, and other beekeeping equipment could be greatly prolonged if they were treated with one of the relatively cheap preservatives.

The best wood preservatives for beekeeping equipment are those which

(1) Remain in the wood for many years;
(2) Are most effective against decay and the attack of insects;
(3) Have the greatest penetrating properties;
(4) Are safe to handle;
(5) Are readily available and economical;
(6) Are harmless to wood and metal;
(7) Permit painting after treatment when desired;
(8) Are fire resistant;
(9) Free from objectionable color or odor.

The effectiveness of a preservative depends on the depth to which it penetrates the wood.

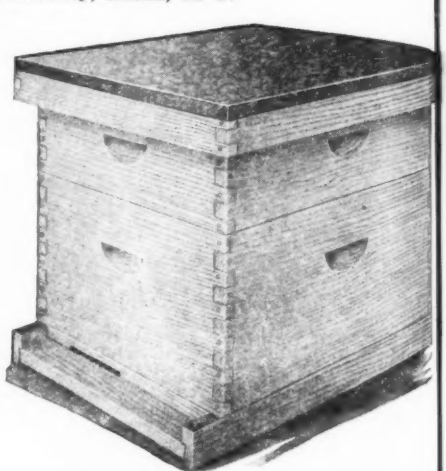
Preservatives fall into three main groups:

(1) Toxic oils, like creosote which are relatively insoluble in water;
(2) Toxic Chemicals, like pentachlorophenol and copper naphthenate which are also insoluble in water; and
(3) Water soluble salts, such as chromated zinc chloride.

Some of the Best Preservatives

Pentachlorophenol is a relatively new highly toxic stable chemical which is effective against the attacks of fungi and insects. Good penetration is secured without heating the solution if the wood is soaked in the preservative for a few days.

This chemical is readily available in concentrated form to be diluted, and also in ready-to-use form. The concentrated solutions are usually cheaper and may be diluted with solvents such as naphtha, mineral spirits, or kerosene, especially if later painting of the wood is desired. If later painting is not desired the concentrates may be diluted with fuel oil or fairly clean used crank case oil. Most of the concentrates are diluted at the rate of about one part of concentrate to about ten parts of kerosene or fuel oil to make a five per cent solution of pentachlorophenol.



Bee equipment can be kept in good shape for many years when given proper care.

For best results the wood should be well seasoned and dry, and should be cut to final dimensions before treating. If boring or cutting is later necessary, the exposed surfaces should be treated with at least one heavy application of the preservative.

Pentachlorophenol is about as economical and as easy to apply as creosote. It is light in color and does not have an objectionable odor. It is sold under various trade names such as Permatox, Wood Life, Wood Tox, etc. Some brands of this preservative contain a water repellent material which should be a definite advantage, especially when it is used to paint the corners of hives, etc., before they are assembled.

The amount of preservative used depends on the material in which it is diluted, the length of time the wood remains in the preservative and the porosity of the wood. In general, the amount used is comparable with other preservatives, such as creosote.

There is no indication that pentachlorophenol is more harmful to bees than creosote, but it is recommended that the bottom boards and other hive parts, which come in contact with bees, be piled outdoors and adequately ventilated for at least a week or two to permit the volatile solvents to evaporate.

Coal-Tar Creosote is a by-product of coal tar distillation and ranges from brown to black in color. It is a highly toxic, relatively permanent material and is insoluble in water. It prevents wood decay and the attack of insects and other organisms and is relatively economical and easy to apply. As it ignites rather easily it is more dangerous to use than some of the other preservatives. The treated wood has a pronounced odor and is dark in color. It has good penetrating powers when it is applied under pressure and it has been used more than any other type of preservative. Treated wood which comes in contact with bees should be piled outdoors for a few weeks to permit the volatile solvents to evaporate.

Copper and Zinc Naphthenates: Both these preservatives have considerable merit but since they are sold chiefly in the diluted, ready-to-use form, they are usually a little more costly. Copper naphthenate is the strongest of the two preservatives and leaves a greenish cast while zinc naphthenate is colorless. Both preservatives dry rapidly and can be painted over after 48 hours of drying. They are insoluble in water and are usually brushed into the wood. They have the important advantage of not giving off poisonous fumes and are considered safe to use on bee hives.

One gallon applied by brush or spray is said to cover 400 square feet of clean, dry unpainted surface but this will depend on the porosity of the wood. These preservatives are also used for treating rope, tarpaulins, and canvas.

Chromated Zinc Chloride is one of the best water soluble preservatives and is now used extensively in place of zinc chloride. It consists of about 18½ per cent of sodium dichromate in a solution of zinc chloride. It is fire resistant, relatively cheap, readily available, and clean. The chief objection to this preservative is that it tends to leach out of the treated wood when in contact with moist earth or water. Treated wood should be piled outdoors and ventilated similar to wood treated with creosote and pentachlorophenol.

Some of the Best Methods of Application

Brush or Spray Treatments: While it may be more convenient to apply a preservative by brush or spray, these methods are not as effective as the processes later to be described, and they are not recommended for wood which will be in contact with water or soil. If the brush or spray method is used at least two heavy coats should be applied as penetration rarely exceeds one-sixteenth of an inch with these methods. For rough lumber about ten gallons of preservative are required to cover 1,000 square feet of surface.

Dipping Process: This method is used with materials such as creosote. The wood is dipped or allowed to stand in the preservative for a few minutes and when the wood is removed the excess preservative is permitted to drain back into the tank. For best results the preservative should be heated to about 200 degrees F. With this method the preservative rarely penetrates the wood more than one-eighth of an inch on the sides and two inches on the ends. Normally from 10 to 15 gallons of preservatives are required to treat 1,000 square feet of surface.

The dipping process is usually more effective than brushing or spraying but it is not as effective as the cold-soaking or pressure methods.

Cold-Soaking Process: This method is recommended for water soluble preservatives like chromated zinc chloride, as well as pentachlorophenol and copper naphthenate which are not soluble in water. Simplicity and moderate cost are the chief advantages of this process. It is adaptable to solutions which cannot be heated with safety.

The wood is submerged in the preservative for a period usually ranging from two or three days to a week or more.

(Continued on page 251)

Bee pasturage in Missouri

DR. LEONARD HASEMAN, University of Missouri, Columbia, Mo.

IN MISSOURI a safe and dependable bee pasturage is one of the most important requirements of successful honey production. It is a thing which should be given careful consideration by the prospective commercial beekeeper.

Missouri lies mostly in the so-called white clover belt and is well situated for successful beekeeping on a small scale. There are comparatively few commercial apiaries due largely to the uncertainty of dependable bee pasture from year to year.

Best Honey Producing Regions

Dependable pasture largely determines the honey-producing regions in any state. In Missouri the best regions lie alongside the larger rivers and particularly those which tend to overflow wide valleys or swamp areas. In such regions usually there is access to much upland with white clover and sweet clover during the summer, followed with summer and fall lowland pasture.

The valleys of the Mississippi and Missouri Rivers and the larger north tributaries of the Missouri River provide some of the best bee pasture. However, there are to be found some quite dependable nectar producing regions along the southern tributaries of the Missouri River and even some of the small Ozark valleys.

Effect of Cultivation on Bee Pasture

In the past when farming was less intense and when greater acreages were left for grazing the problem of bee pasture was less acute. Every time that a pasture with its stand of bluegrass and white clover is plowed up the bees are deprived of that much clover pasture. Unfortunately, bees can gather but little nectar from most cultivated farm crops. It is the wild pasture which is most valuable to them.

Sweet clover and alsike clover are, to be sure, important nectar-producing crops which farmers grow but when these crops are cut for hay much of the supply of nectar is lost. The more a region is given over to the growing of the usual cultivated crops the less valuable it becomes as a honey producing region.

Overstocking a Region

Every honey-producing region has a limit to the number of colonies of bees it will sustain economically. Regions which are only average good for beekeeping may become overstocked with bees. This is particularly true during unfavorable seasons.

While Missouri, as a whole, in favorable years could easily maintain ten times as many colonies of bees as are now present, in poor years there is not sufficient nectar in most sections for the present supply of bees. Under prevailing conditions, therefore, the large commercial beekeepers find it necessary to scatter their colonies of bees in outapiaries, so as to prevent overstocking their region in bad years. This uncertainty of annual profitable nectar flows is what makes the development of commercial beekeeping unsafe in Missouri.

Factors Affecting Nectar Flow

IT IS a perfectly well-known fact that white clover and the other nectar-producing flowers do not always produce an abundance of nectar. Some seasons the pastures may be white with clover and yet the bees store little or no white clover honey.

The nectar-producing crops vary from year to year, both as to the abundance of blossoms and the amount of nectar in those blossoms. It is also true that plants which produce nectar abundantly in one part of the country may produce but little in another region. Alfalfa and buckwheat are both important nectar crops in their favored regions but of little value as such in Missouri.

It is not entirely clear just what causes a variation in a plant's ability to produce nectar in different years and regions. It is true that proper moisture in the air and soil combined with favorable combinations of temperature and no doubt other soil and air conditions influence the flow of nectar. Too much rain spoils a honey season as will also a drought. Weather favoring a vigorous growth of the crop and an abundance of blossoms followed by well-timed showers with warm days and cool nights usually insure favorable flows of nectar.

While it is true that nectar flows do vary, neither faulty nectar flows nor overstocking of the region will account for the inefficient beekeepers' failure to get a crop of honey when his neighbor secures a bumper crop. They are often used merely as an alibi.

Growing Nectar Producing Crops

Except where it is possible to utilize flood lands and other waste areas, the beekeeper cannot afford to grow nectar crops simply for bee pasture. There must be some return through the use of the crop also as pasture for livestock, as forage, for seed, or for other purposes.

Sweet clover used as a pasture crop will bloom and yield much nectar. Where grown for seed it is very valuable as a nectar crop. Alsike clover on wet soil for hay or pasture is usually a heavy nectar producer. Crimson clover where it does well and, no doubt, other legumes will be found of value as nectar crops where they can be grown profitably for seed, hay, or pasture.

A Few Short Words

MILTON H. STRICKER, Annandale, N. J.

IN A RECENT issue, I wrote a brief comment on the practical side of antibiotic control of bee diseases. Such a few words, and such an inconspicuous place in Gleanings, but more fan mail has resulted from this than anything else I ever wrote.

Several inspectors and ex-inspectors wrote commending the comment. Many mentioned their problems with the unsatisfactory application by beekeepers.

Several beekeepers wrote telling their experiences (mostly sad stories). One even mentioned how he tried it on five colonies, thought it was 100 per cent effective and after some years of treatment, let the equipment mingle with other colonies and then later found he had super infection. Now he has over 1500 colonies that he must perpetually feed. His words: "If I knew then what I know now—I'd never get within flying distance of sulfa again."

A few writers condemned me roundly. How easy it is to get condemned. Must be the price we pay for freedom of speech. One even wrote a rather strange letter on his institution's stationery. Wonder if his boss saw it? But his vituperation rang rather hollowly and only convinced me of the old proverb: "Once a crackpot, always a crackpot!"

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More secrets in mountain honey production

CARL M. TEASLEY, Apison, Tenn.

RECENTLY while selling honey I chanced to sell a storekeeper-beekeeper. He admitted that he bought because his bees had made only dark honey and very little of that. Then to my amazement he lifted one of the light-colored jars from the case, walked through his storeroom and out into his backyard. Here he marched up to his five hives of bees busily at work and held the jar high into the air.

"All right, you fellows," he said "go thou and do likewise, or you're fired."

To his bees such would have been a physical impossibility because (1) his apiary was located 146 miles from the mountains where my bees produced the honey, and (2) the flow from which the light-colored honey came was history by a month past.

Such shows the folly of some beekeepers and honey eaters, however.

It is because mountain honey production requires several somewhat different approaches that these few facts, or ideas, are presented.

One production problem quickly presents itself in my territory if the bees are moved too quickly to the mountains. Mountain laurel blooms at the same time as tulip poplar and often yields beyond the period of poplar bloom, especially in wet seasons. The honey from mountain laurel is very bitter and toxic, and is a yearly threat, but the bees consider it good honey and gather it in copious crops about one year in four. On these years I super lightly, with foundation mostly, and extract the crop quickly, storing it in cans for fall feedback. The resulting drawn combs are not tainted in the least. Full combs in the broodnest are also either extracted or set aside for future feed. Thus bitter honey can be an asset.

Inspection for diseases are made twice before the bees are moved to the mountain, but always if some honeydew is gathered during their stay in the mountains a few colonies show dysentery by the following January.

Carl M. Teasley

At least five pounds of sugar syrup is fed to all these colonies, the syrup being made one third sugar to two thirds water. The syrup appears to offset the dextrin in the honeydew.

A notebook shows that the dates for starting of flows rarely vary over five to seven days, so management can be geared to these dates:

Poplar and/or laurel starts from May 6 to 12;

Persimmon, sumac, and basswood, May 28 to June 5;

Sourwood, June 10 to 16;

Dwarf sumac (frequently a saver of seasons if all else fails), August 6 to 12.

Minor sources of nectar from August 15th to frost are mountain mint, golden honey plant, purple and white aster, and serecia lespedeza.

Section and Chunk Comb

I HAVE found that the nearer to a honey flow one waits to fold sections, and put in foundation the quicker bees draw out comb. This idea works also in chunk comb production.

A quick way to put foundation in thin top-bar frames is to lay the frame on its back, place the sheet of founda-

The bees are doing their part with this chunk comb super one week after it was placed on the hive.

tion onto the groove of the top bar, and then crimp that edge to the wood by mashing with the fingertips. Then taking either a cool or warm casing knife, seal the wax to the wood on the farthest side of the groove. In this way the foundation will hang in the center of the frame when returned to normal position if the knife does not cut the wax in such a way as to allow breaks. Careful work allows for hauling supers without the foundation breaking loose from the top bars.

Dirt daubers and wasps seem to love stacks of prepared supers in which to nest if those stacks were made three to six months before being needed, and holes for entry made available to them. Such caused my change to the just-before-needed idea.

In both section and chunk comb production a strip-down method is used. Thus hives with two brood chambers and one and one half stories for brood are stripped to one when the flow has started. A semi-clear brood nest of eight frames of brood and two empty outside frames is arranged—no queen excluder is used—then the supers of foundation stacked on, usually two in number on average colonies, three on above-average colonies. Bees on the combs which are removed to extracting colonies are shaken onto the ground in front of each chosen section or chunk comb hive when the stripping down is done. Thus the bees in the section and chunk comb hives are forced quickly into the supers, and having plenty of field bees make their best showing.

Queens in extracted honey colonies are allowed the run of the hives at all times, but most of the brood is kept in the lower brood chamber either by moving frames of brood downward or by switching of brood chambers if the upper one has the most brood. Top supering only is used on these colonies during the sourwood flow. Some under supering (placing supers of foundation under partly drawn and sealed supers) is done during a heavy poplar or mountain laurel flow in order to gain more drawn combs for future use. If the bees are slow to work these supers then a drawn comb is placed in the center as a lure. If the bees fail to draw comb in three days after such a measure then a frame of brood is substituted for the lure comb. This last is an emergency measure.

The honey crop is removed from the bees by use of carbolic acid boards. Full supers and supers of filled frames from partially full supers are lifted to the top of the hives in advance before use of the boards. As the supers are placed on the truck in five-high stacks an inner cover is nailed lightly on top of each stack to forestall robbing.

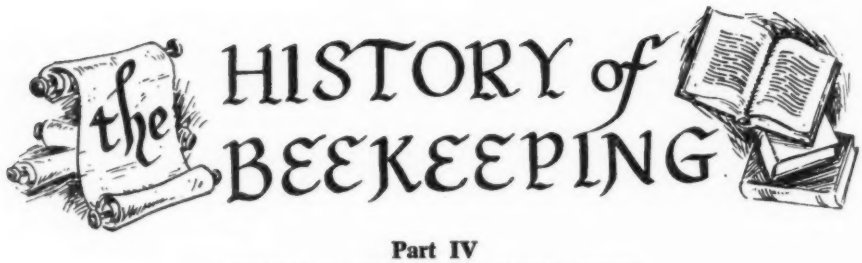
Treatment of combs is done with carbon disulphide at the honey house. The combs are stored on the bees over winter above an inner cover, being placed there as soon as cool weather sets in, or early in November.

I practice requeening half my bees one year and the other half next year. Late August or early September is the best time for acceptance. However, I do have nucs with young queens ready if needed should a queen fail drastically at any time. Breeder queens are chosen from gentle and heavy producers—not my heaviest producer, because a "sport" or freak cannot be reproduced.

Our Cover Picture

THESE TWO honeys are starting off National Honey for Breakfast Week, April 10 to 16, in the proper way. On the left is Linda Lorenson and on the right is Cheryl Barth, both Medina, Ohio, children.—Photo by W. Barth.

XUM



Part IV

GEORGE P. GEORGHIOU, Nicosia, Cyprus

(Continued from March)

1874 A.D.—The British Bee Journal described numerous bee escapes which were very crude but which were a start toward the present day perfection (see 1891).

1875 A.D.—Death of Moses Quinby.

1876 A.D. —Charles Dadant made the first attempt to import Cyprian queens into America, through his correspondent in Italy. When the bees arrived in Italy from Cyprus, all the combs were found smashed and the queens dead (see 1879).

The use of sugar candy for feeding bees was known as early as this date. Langstroth's 1876 edition (fourth edition) gives a formula for the making of sugar candy, recommended by Rev. Weigel of Silesia, Germany.

1876 A.D.—First issue of the Beekeeper's Magazine (U.S.A.)

J. S. Harbison, California, was probably the first to call attention to the possibility of successful migratory beekeeping by means of the railroad. He loaded his bees on cars and moved them 60 miles to a new honey location and after the bloom was over, he returned to his home location.

1876 A.D.—A. I. Root built his first roll comb foundation mill. Inaccurately, he had the die faces on the rolls cut for five worker cells to the inch. In later years he found that the correct linear measurement was 4.83 cells to one inch. Thus he explained why the queens preferred to lay on naturally built comb than on comb built on his foundation. His later combs were made on the basis of 4.83 cells to the inch and this has been the standard of brood foundation in the United States for the last 70 years.

1877 A.D.—The first record of an attempt to control bee diseases by legislation, is an act for San Bernardino County, California, passed in 1877. (see 1883).

1877 A.D.—First edition of ABC of Bee Culture by A. I. Root.

1878 A.D.—Charles Dadant started a movement against the adulteration of honey and for the establishment of a federal law opposed to such practices. Beekeepers joined him enthusiastically. (see 1906).

C. O. Perrine, of Chicago, a dealer in honey, conceived the idea of a floating apiary on the Mississippi River. He thought that by moving the bees north as spring advanced it would be possible to extend the season and keep the bees busy for a much longer period. He invested $15,000 in the outfit, including steamboat and barges. He started north with 1000 colonies. His attempt was a failure because of the heavy losses of bees (as much as 25 per cent) occurred from falling into the water. Perrine's attempt aroused an immense amount of interest and one other beekeeper attempted to follow his example, but again unsuccessfully. No more attempts were made.

1878 A.D.—W. L. Boyd (America) seems to have been the first to suggest cups for queen rearing, on the order of those afterwards developed by Doolittle (see 1889). He wrote in Gleanings suggesting cutting out the acorns or rudimentary queen cells always to be found in every hive. He pointed out that by taking a flat stick and transferring a newly hatched larva to the acorn, the bees would care for it, and soon nice sealed cells would be made available. Root carried the suggestion further by outlining how artificial cells could be made by dipping a wet stick in melted wax. This suggestion was ignored for a number of years. (see 1889).

1878 A.D.—Conception of the idea of wiring the frames by A. I. Root.

1879 A.D.—A. I. Root, proposed the idea of selling live bees by the pound. This idea later resulted in the package bee industry. (see 1913).

1879 A.D.—Henry Alley (U.S.A.) imported bees from Hungary into the United States, but appears not to have profited by the experience.

Charles Dadant, stated at the National Convention, that only two Cyprian queens had reached America up to that time.

At the Michigan beekeepers' convention, a committee had been appointed, to look into the matter of importation of desirable foreign races into the United States. (see 1879 below).

D. A. Jones (Canada) and **Frank Benton** (U.S.A.) sailed for Europe, to import the Eastern races of bees into America. They arrived in Cyprus in the autumn of the same year. There they established an apiary for the purpose of breeding queens. They also visited Syria and bought Syrian bees. (see 1880).

An old illustration of bees and beekeeping. — Photo by J. K. Vermaas, Netherlands.

James Ferncrook, an employee in the factory of Lewis & Parks, Wisconsin, U.S.A., modified the "section honey comb" (see 1857) into the one-piece section with the V-shaped grooves to permit folding, as it is used today.

1880 A.D.—D. A. Jones returned to Canada from Cyprus, bringing with him 150 colonies of Cyprian bees and some Palestinian colonies, which he commenced selling in the U.S.A., and Canada. Frank Benton his co-worker stayed in Cyprus to continue the work.

1880 A.D.—Frank Benton developed the first queen mailing cage, which with some slight changes is in common use until now.

O. K. Townsend, Michigan, U.S.A., described in Gleanings of Bee Culture, his method of queen rearing, by fastening strips of new comb containing eggs in position with cells opening downward. (see 1883).

Frank Benton went from Cyprus to Ceylon and Sumatra, for the purpose of introducing the Giant bees into America, but was unsuccessful.

Several flat-plate comb foundation machines were developed. Many thousands of the Rietsche press, made in Germany, were sold in Europe, but none in the United States.

1881 A.D.—Probably the first bee disease law of state wide application was the one passed by Michigan in 1881. (see 1877). It made it unlawful to keep any colony of bees affected with foulbrood and provided that such diseased colonies should at once be destroyed by fire or interment.

1882 A.D.—A. I. Root offered $1,000 for proof showing that manufactured comb honey had been or ever was on the market, the product so perfect that it could not be detected from the genuine.

1882 A.D.—Frank Benton made the first shipment of Carniolan bees into this country, in the early 80's.

1883 A.D.—The first state law for appointment of bee inspectors was passed by California, and provided that the board of Supervisors of any county

was authorized to appoint bee inspectors. It required that the bees found to be diseased should be burned the following night together will all hives and combs, or that such equipment should be buried in the ground.

Henry Alley (U.S.A.) improved the existing queen rearing methods by advising the use of a "swarm box" with top and bottom wire cloth, in which to confine a strong colony of bees without a queen or brood for several hours. Four days previous to the making of this cell building colony, he had placed a new comb in the center of the brood nest of his breeding colony. This comb then would be filled with eggs and newly hatching larvae. With a sharp knife he cut the comb into strips by cutting through every alternate row of cells. The cells on one side were cut down to within one-quarter inch of the midrib. To insure uniform distribution he then destroyed every alternate egg or larva. The strip was then fastened with warm wax to the lower edge of a comb which had been cut down to about one-half its normal size. These prepared combs were placed in an empty hive and put down on the stand from which the bees in the swarm box were taken. The bees were then released and immediately started giving attention to the newly prepared cells. (see 1889).

1883 A.D.—Dathe made the first successful importation of Giant bees into the United States. The bees did not seem to take kindly to domestication, and since this time no effort has been made to confine them to hives, as they prefer the open air and to hang their single combs on limbs of trees.

1885 A.D.—The National Beekeepers' Union was organized. The Union had as its purpose the settlement of disputes and the defending of the legal rights of the members in courts. It served beekeepers several times. After a time it was discovered that the work of the new Union could be as well done as an activity of the parent Society (The North American Beekeepers' Society) and so the two were merged under the name of National Beekeepers' Union (see 1899).

D. A. Jones established the Canadian Bee Journal.

The activities of the United States Department of Agriculture, in bee culture, began with the appointment of Nelson W. MacLain, as Special Apicultural Agent. The work was discontinued for a short time and resumed again in 1891. Since this time the work has been continuous.

The Heddon Hive was patented and introduced. It uses one brood chamber divided into halves horizontally. The divisible feature enables the operator to find the queen by shaking the bees out of one or both of the shallow sections. This hive was proved a failure and was abandoned in the late 90's.

1886 A.D.—Von Planta (Switzerland) demonstrated that levulose and dextrose exceed the sucrose in the nectar of some plants. Before that it was believed that sucrose was the sugar of nectar.

The question on whether it was legal to ship bees through the mail in America was settled by section 372 of the Postal Laws approved March 3, 1886, in which it was stated; "Queen bees and their attendant bees may be sent in the mails, when properly put up so as not to injure the persons handling the mails, nor soil the mail bags or their contents."

McLain (U.S.A.) reported that he invented a queen clasp made of a split wooden block, for holding the queen and inseminating her artificially. A hypodermic syringe was fitted with a nozzle and used to inject the sperm "from the bean of the drone" into the vulva of the queen. Out of 27 inseminations by this method, six proved to be successful. After this attempt he met with success only occasionally. (see 1888).

1888 A.D.—The Beekeepers' Review was founded by W. Z. Hutchinson. It attracted much attention and it remains as a good source of reference. For a number of years it has belonged to the National Beekeepers' Association. It was absorbed by the Beekeeper's Item in 1933.

1888 A.D.—Revision and enlargement of Langstroth's "Hive and The Honeybee" by Charles Dadant and Son. The original 1853 edition by Langstroth was revised by him in 1857 and 1859 and large editions without further revision had been made until 1888 when Dadant revised it.

McLain (also Davitte 1935, and Kinzie 1936) reported considerable success

(Continued on page 248)

Choosing the apiary site

Consider the bees when selecting a location

ROGER A. MORSE, State Plant Board, Gainesville, Florida

Part II

(Continued from March)

When the beeyard is level and the hives placed in straight rows mowing is made much easier. These hives are in groups of two and on hive stands six inches high. Note the alighting boards in front of the hives.

BEES, NOT MEN, are the honey producers. We have learned that cows, chickens, and the rest of our livestock will produce more when properly cared for. The honeybee is no exception and the beekeeper can gain much by choosing the proper location.

The honeybees' life is only about six weeks in the summer months and three weeks of this time is spent in the field. It is fairly easy to determine a bees' age by its shiny appearance and by the condition of its wings. As the bee grows older its wings become frayed and have jagged edges. Fighting strong winds contribute to this wing damage which in turn may shorten the bees' life. The beekeeper can do much to locate the yard to facilitate flight to and from the apiary.

Windy areas do not make good wintering locations and should be avoided. Not only is the inside temperature of the hive affected but more bees may be lost while on flights than is necessary or the location might be so windy that flight is retarded. A favorable wintering location allows the bees to leave the hive for a short cleansing flight and return on a sunny winter day without interference from wind.

The southern or eastern side of a large building may afford good protection from prevailing winds but a building can also deflect air currents and thus interfere with bee flight. Because of these deflected air currents it is best to establish only a few colonies in protected spots by buildings.

Solid windbreaks of pines or conifers which are sufficiently thick to deflect wind currents should also be avoided for this same reason except in cases where only a few hives are present.

Air drainage also seems to be an important factor in successful wintering though in a less tangible manner. The location should be such that there is a slow but constant flow of air over the area. A slope is therefore best. Locations near constantly moving streams or creeks provide good air drainage. However, streams which move too fast can cause too rapid a flow of air and thus be troublesome.

An area which allows no movement of air would be the opposite of an extremely windy location. Bee flight would either be restricted because the area does not warm up (such as an extremely shaded area) or warms up too much when exposed to the sun. A

This beeyard is well protected on the north and west. It receives all the available sunlight in early morning but is not shaded during the day. There is no provision to force the bees up in the air and this can be a problem when men are working in the field in front of the hives.

localized area which warms up or has a higher temperature than that in the immediate vicinity may cause excessive bee flight. If a bee leaves a hive under such conditions it may successfully return to the hive or it may be caught by a pocket of cold air or wind a short distance from the hive and be lost.

Good Management will Control Nosema

MOST BEEKEEPERS recognize that the control of Nosema disease is largely a question of management. The Nosema organism grows most rapidly at temperatures slightly less than brood rearing temperature. If brood rearing temperature (92° to 95°F.) can be maintained by the colony there will be less trouble from Nosema.

During the spring those colonies which are protected from winds and have the full benefit of the available sunlight suffer very little from Nosema. Wooded and shaded areas should be avoided; likewise hills which slope to the west or north. During the honey flow early and late sun will allow the bees to leave the hive earlier in the morning and return later at night. The most desirable location will have shade for the bees part of the day during the hot months.

Bees use large quantities of water in the hive both for cooling the hive and to dilute honey especially in the spring for feeding the brood. Clean water especially in the control of Nosema disease is important. Stagnant pools, holes, or low spots which hold water after rains can serve as a source of Nosema infection. The spores which are in the fecal matter when it is voided remain alive in water and may grow if picked up by a bee gathering water.

The character of the soil in an apiary can have a direct effect on the bees especially during the winter and spring months. Heavy clay or clay like soils are not desirable since they hold too much water. A sandy type soil removes excess moisture immediately.

Equipment, especially bottom boards which are wet, has a shorter life and can also make the bees uncomfortable. A wet bottom board will help to cool a hive and lower the temperature below the desirable point. A wet location with its resulting wet or damp bottom board can thus aid in the spread of Nosema in the spring by lowering the brood rearing temperature.

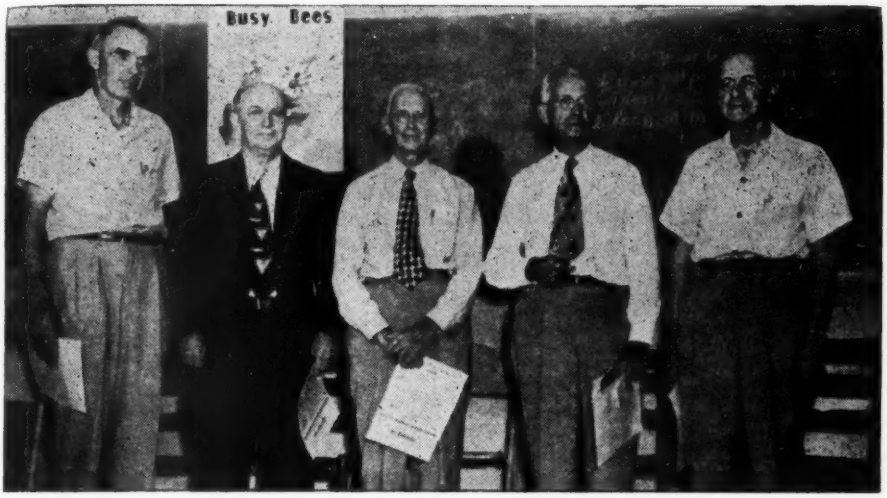
During the winter months a damp bottom board may increase the humidity in the hive. High humidity makes the bees uncomfortable and unable to void excess water. High humidity can also aggravate a condition of dysentery. Dysentery and Nosema being more likely to occur in wet and poorly drained locations, has led many people to confuse the two conditions. There is no doubt that either a condition of dysentery or Nosema will contribute to the severity of the other.

There is always a certain amount of drifting in a beeyard which would appear to do little harm. This is noticed when apiaries are moved. Placing colonies in groups of two is becoming more popular in the northeast states. These groups are usually six to eight feet apart, depending upon the space available. Here the convenience of the operator is considered and the colonies placed so they can be worked easily. Small trees, other markers, or a range of colors in the yard will help to orient the bees. The greatest danger of having colonies too close is that young queens on their mating flight may not be able to find their way back to the hives.

(to be concluded)

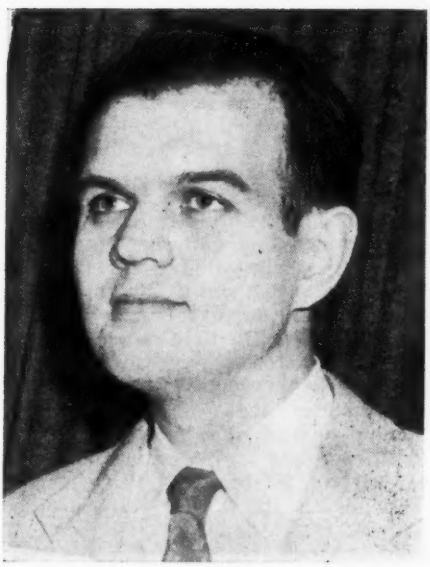
How many can you identify?

See page 241 for correct answers.



Left to right: 1, 2, 3, 4, 5.....

6. .....



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Live and Learn

by Propolis Pete

THERE HAS been quite a bit of talk lately about the use of dry sugar as feed for bees. It is good as a reserve, either put on when packing for the winter, or it is good to carry colonies through the difficult spring period. I have heard, but have not noticed for myself, that it doesn't have much value as a stimulant for brood rearing. Be that as it may, the fact is that if your bees exhaust their stores during those critical spring days, a supply of dry sugar will carry them through. If it doesn't keep the brood going, at least it will keep the bees going. For my part, I am thoroughly sold on the idea.

Usually it is fed by putting it on the inner cover, and removing the block. My experience has been that this isn't enough, so I have made for myself some deep trays out of marine plywood, with common shingle lathe as side rails. See the picture herewith. These trays will hold ten pounds of sugar, and a lot of beekeepers tell me that this is too much. Maybe it is, because it is seldom that the bees use all of it. But, what they leave can be saved and used for syrup when installing packages, or as liquid feed in the fall. Another reason for making them so deep is that I save elbow grease by not having to rip down the side rails, and more room than is needed is no handicap. If you don't want to put in ten pounds of sugar, there is no law that says you have to. They hold one pound just as easily.

When I feed dry sugar, I generally take along a pail of water and a rubber bulb with a sprinkler head. While the bees will gather water and melt down the sugar without any help, it is a big help to them if you sprinkle a little water around the edge of the section in which they are working. Also, in some cases, they will carry out of the hive any undissolved lumps of sugar bigger than a single granule. Some people say that if you have to go to all that trouble, you would be better off to give the bees syrup. 'Taint so. Actually it's the easiest thing to do, with no mess or bother. The fact that I do it should be proof that it is easy and labor saving.

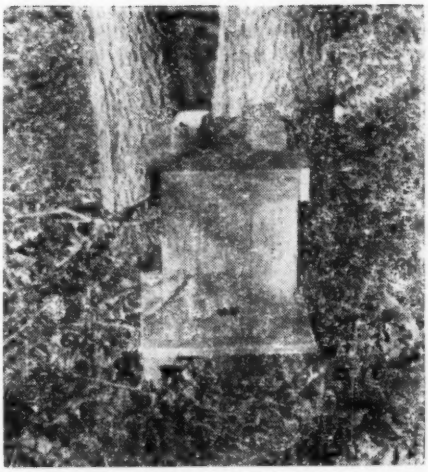
Feeding tray

SPEAKING OF feeding for the winter, I told you last fall that when I packed, several of the colonies were so light with stores that I doubted that they would pull through. Since I see no profit in uniting a lot of old bees in the fall, I just abandoned these colonies. No miracles this year—they are all gone. I am beginning to think that the sensible thing to do with such colonies is to gas them in the fall; then you can salvage whatever stores they had to start packages in the spring. I can't see the sense of monkeying with weaklings. Cruel or not, it seems saner to get rid of them quickly than to have them linger and die the slow death of starvation and freezing. Strong new packages or swarms hived on these combs can have a chance of producing something for you.

And, speaking of swarms, during my beekeeping experience, I have had swarms come in out of the woods and take possession of piles of supers or empty hives in my bee yards. Whether they were attracted by the flying of the hived bees, or whether it was just coincidence that they happened this way, I'll never know. But three years ago, during the winter when we like to putter around with useless things, I knocked an old crate apart and rebuilt

it into a box hive. This was duly placed in what looked to me like an attractive location, and spiked with some old comb bits so that any scouts that might come around would think that it was a pretty likely place to live. Here's a picture of it. Any self-respecting swarm of bees should be glad to get such a nice snug home that some fool beekeeper couldn't tear apart seven times a week, after blowing a lot of stinky old smoke into their eyes, but the cruel fact is that I haven't even seen a single scout bee looking it over. I also have a couple of other monstrosities scattered around through the woods—an old keg, a jumbo hive complete, and some spare supers, but no luck. I can't understand it. When I didn't encourage them they came, and now that I have things fixed up for them they don't come.

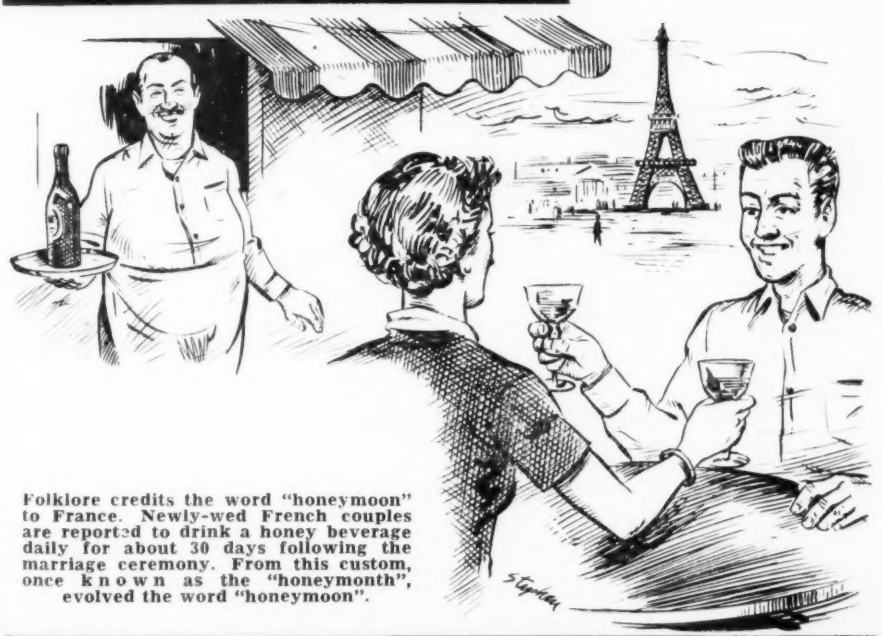
Well, this is written for April. It won't be long before things really open up. It will be good to get my fingers all stuck up with that darned propolis. Gosh, don't I wish that someone would invent a commercial use for the stuff. My fortune will be made.



Propolis Pete's box hive for stray swarms.

Bee Lore

Edited by Walter Barth



Folklore credits the word "honeymoon" to France. Newly-wed French couples are reported to drink a honey beverage daily for about 30 days following the marriage ceremony. From this custom, once known as the "honeymonth", evolved the word "honeymoon".

XUM

Editorials

Honey for Breakfast Week

FOR A NUMBER of years the American Honey Institute has selected one week during the month of April to emphasize the use of honey for breakfast. This year it occurs the week of April 10 to 16. This offers an opportunity for beekeepers to get behind their product in order to encourage the use of honey during this week. Beekeepers who have their honey in grocery stores could make a window display using cards and other printed matter supplied at a very nominal cost by the American Honey Institute, Madison, Wisconsin. Newspaper advertising prior to Honey for Breakfast Week should result in added sales. Many people use honey on breakfast food, toast, and for sweetening coffee. Those who have formed the habit of using honey in this way are likely to continue. Let's get behind this Honey for Breakfast Week.

Hot Winds from the North

THOSE OF US who live in the northern hemisphere perhaps fail to realize that in the southern hemisphere cold winter winds come from the South and warm, balmy breezes from the North. It would appear then that beekeepers living in such countries as Australia, New Zealand, Argentina and South Africa, face their hives to the North instead of the South to take advantage of the winter sunshine, also to prevent the cold wintry blasts from entering the fronts of hives.

The January 15, 1955, issue of The Australasian Beekeeper, on the Talks to Beginners page, mentions a beekeeper having combs of honey melt down in hives during very hot spells. We quote the following: "At the peak of the heat with the hot north wind at its worst, we noticed our bees beginning to vacate their hives and crawl on the ground,—and some combs were melted down."

Can Colonies Be Too Strong?

A BRIEF REVIEW of the history of beekeeping in this country indicates that prior to the use of the food-chamber hive, a considerable percentage of colonies going into winter quarters were rather small. If they were below par in the fall, they would likely be weak in the spring, if they managed to live through the winter.

About 25 years ago when the food chamber hive began to be advocated and used, the population of colonies going into winter quarters increased, mainly because the use of the food-chamber hive (which means wintering in a double instead of a single brood chamber) supplied colonies with an abundance of stores, also adequate comb space for early brood rearing.

Obviously such populous colonies can withstand the rigors of cold winter weather better than weaker colonies. Furthermore, such colonies are likely to be populous in the spring to take advantage of early honey flows. As a matter of fact, some of these colonies may reach their peak of strength before the major honey flow starts.

Some beekeepers say that they would prefer to have weaker colonies in

the spring that would build up gradually, attaining their full strength at the beginning of the major honey flow. However, it is more difficult to winter weak colonies than strong colonies and attempting to winter weak colonies would likely result in heavy winter losses.

To get the most out of such strong colonies, it seems necessary to divide them at the beginning of the fruit bloom and dandelion honey flow in the spring, giving the queenless divisions young laying queens. It may be necessary to do some feeding. With intelligent apiary management, both divisions can be built up to colonies sufficiently populous in bees to take advantage of later honey flows.

In parts of the Red River Valley some commercial beekeepers divide very populous colonies at the beginning of the dandelion flow in early May, giving queenless divisions laying queens. After surplus honey is removed in the fall, the colonies are united by placing the colonies with young queens on top of colonies with the old queens. The young queens are usually retained and the old queens killed by the bees. A deep super well filled with honey is retained as a food chamber for each of the united colonies which means three-story wintering. Each large united colony is likely to winter well and consume less stores than the two colonies would if they were not united. The large three-story colonies should have enough bees, brood, and honey to be divided in the spring and such dividing is a swarm-control measure.

It seems preferable to maintain populous colonies of bees throughout the year in order to take full advantage of honey flows that may occur. It is the strong colones that put up good crops of surplus honey when available, while weak or mediocre colonies may make a little better than a living. We maintain therefore, that colonies cannot be too strong.

What Do Our Readers Want?

SOME YEARS ago we sent out a questionnaire to a cross section of Gleanings' readers to try to find out what departments of Gleanings they preferred. The replies, while interesting, were not overly illuminating.

Some liked one part of the journal, while others didn't care for it. Some enjoyed scientific articles, while others had no use for them. Some enjoyed experiences of beekeepers in different parts of the country or the world, while others preferred to read articles that were more scientific, based on experimental work. Some liked articles regarding beekeeping in foreign countries, others thought we should restrict matter to beekeeping in the United States. A few apparently were interested only in the affairs of their own state or county.

It would seem that every beekeeper, whether he owns one or one thousand colonies, should be interested in getting sort of a bird's-eye view of our industry and in order to do this, he has to know what is going on outside of his state or province.

It is difficult, if not impossible, to please all readers, even though we make an honest effort to do so. We do try to help beekeepers to keep bees better.

Eastern Hobby Beekeepers to Meet

HOBBY BEEKEEPERS from Maryland, Virginia, Delaware, New Jersey, New York, Pennsylvania, and New England will meet as a group for the first time at the University of Maryland, June 17, 18, and 19. Credit for planning this meeting goes to Dr. G. J. Abrams, J. I. Hambleton, and to some members of the Rhode Island Beekeepers' Association. Complete details can be obtained by writing to Dr. Abrams, at the University of Maryland, College Park, Md., or to Mr. W. K. Davis, 81 Bergen Street, Providence 8, Rhode Island.

The idea for this meeting apparently originated with James I. Hambleton as a result of the successful tri-state meeting held in Rhode Island in 1954. The idea has caught on rapidly, and through the unselfish efforts of a number of beekeepers, such as Dr. G. J. Abrams, Gaston Levitre, Bill Davis, and others, the affair will undoubtedly be the best hobby meeting ever held.

We wish success to this historical meeting and to the hard-working members of the different beekeeping associations who are striving to make this event one to remember.

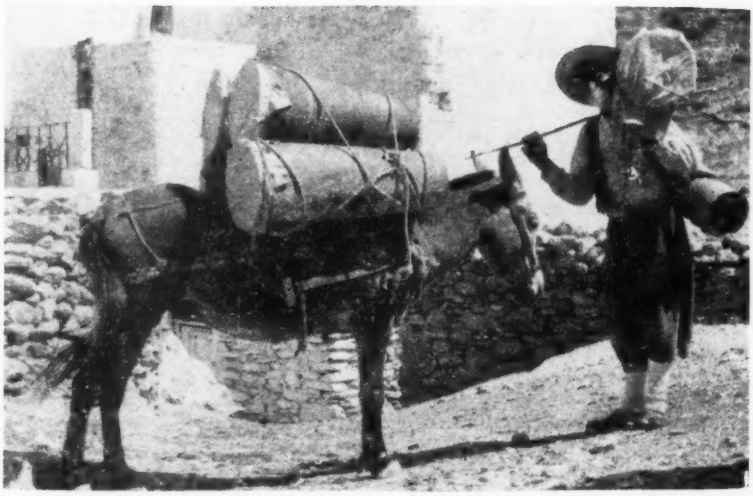
XUM

News

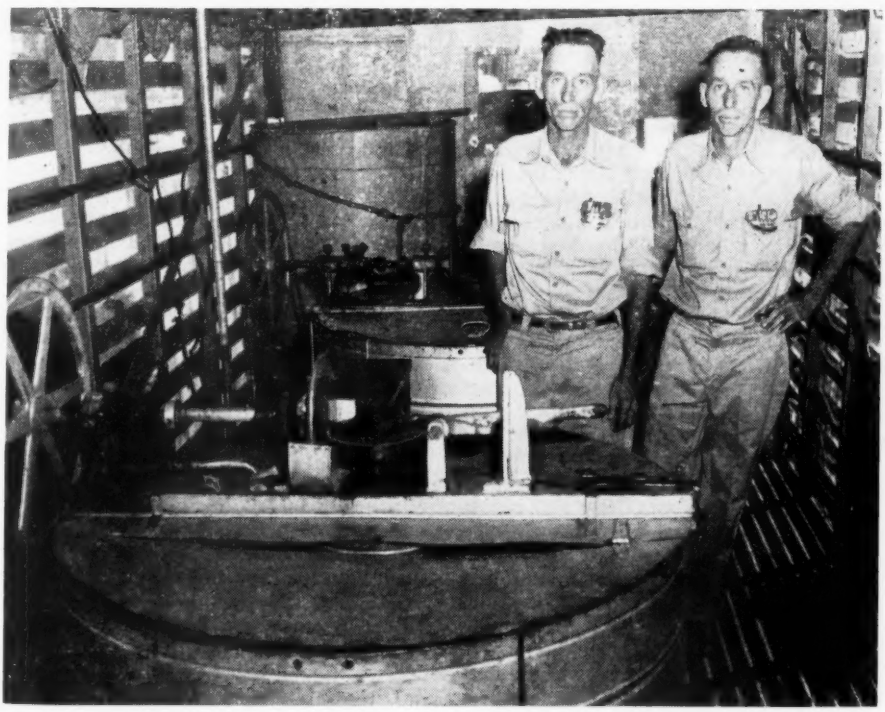
Beekeepers discuss the recent Chicago convention at a meeting at Meineke's Honey Farm, Palatine, Illinois: (L. to R.) : W. A. Shaeffer, Federation President; John Lis, Convention Chairman; L. P. Baker, Convention Committeeman; M. G. Dadant, American Bee Journal Editor; Miss Monica Siegham, American Honey Queen for 1955; A. I. Root, American Honey Industry Council member; and Carl E. Killion, Chief Apiary Inspector, State of Illinois.—Photo by David Meineke.

Michigan Veterans: Left to right, James E. Harwood, Beulah; Floyd W. Hatch, Copemish; Chan Freeman, Mesick; the late Jay Cowing, Jenison.—Photo by E. C. Martin.

reel



On the island of Ios, where roads are non-existent, this is the traditional way of transporting the bees to the heather—a donkey must carry four of the cylindrical hives, the beekeeper two. The journey involves a two and one-half hour continuous climb over boulder strewn and precipitous mountain tracks. In spite of the effort entailed, 3,000 colonies are nonetheless thus annually moved to the heather on Ios.—Photo by Brother Adam of England.



Howard and Harvey Hatch, twin brother-beekeepers of Marathon, Texas, who founded the Big Bend Honey Company more than 20 years ago. One year the brothers' honey harvest totaled 1,000,000 pounds.—Photo sent by D. C. Babcock.

XUM

Let's talk about honey plants

HARVEY B. LOVELL, University of Louisville

Maples. The earliest spring trees which give pollen and nectar in most parts of the country are the red and silver maples. Although blooming before the leaves come and otherwise having the appearance of wind-pollinated trees, maples have reverted to insect pollination. The trees of any particular species are of two kinds, male or staminate with numerous clusters of stamens, and female or pistillate with ovaries ready to produce seed when propery pollinated by the visits of insects. Both sexes secrete nectar but of course only the male trees yield pollen. My first pollen in Kentucky this year came from these maples on February 27 after two or three days of warm weather.

Delaware. I recently received some Spanish needle honey from George H. Latham, of Wilmington. The section was very attractive with the light yellow comb. The extracted honey had a beautiful yellow color and a rich, distinctive flavor. It seemed to me to be a little stronger than Spanish needle honey from Missouri and Arkansas where a great deal is produced.

Florida. E. S. Brantley of Grandin writes that in Northern Florida his bees begin to bring in pollen around December 25 and continue to do so on through the winter. The pollen comes chiefly from sand pine and maple. He takes advantage of this early pollen and feeds his bees honey and water to build up his colonies for the orange flow which comes around February 20.

He adds, "I keep in close contact with Mr. John Haynie, extension apiarist, of the University of Florida and he is due the credit for this venture of mine."

Maine. From New Gloucester comes a most interesting letter from Donald C. Chandler. He is adding honey plants to his horticulture line. He writes that he has become a beekeeper in order to get his six acres of strawberries pollinated. He adds, "Because of my interest in strawberry and gladiolus seedlings along with several other plants, an interest in honey plants came along. This spring we shall start a trial garden of honey plants."

Female Male
Silver Maple

Oregon. From Hermiston my correspondent, W. G. Rodda, sends a long list of first dates of blooming going back to 1913 when violets bloomed on March 1 and jonquils on March 6.

Kentucky. My first pollen came on February 27 this year in Louisville. I found both red maple and silver maple in full bloom after two or three days of warm weather, following a very cold spell in the middle of February. Other plants starting to bloom in February are elm, chickweed, snowdrop, and crocus, all of which are occasionally visited by bees.

California. Samples of honey have just been received from George J. Brown of Fresno. Wild buckwheat (**Eriogonum**), not to be confused with cultivated buckwheat, makes a light amber honey of good quality. The flavor seems to me to have just a slight resemblance to cultivated buckwheat but is much milder. I am happy to add this sample to my growing collection.

A Talk to Beekeepers

M. J. Deyell

I Hate to Jump In

THESE TALKS have to be written periodically on schedule time in order to meet the deadline. While I enjoy this part of my work, I usually hesitate about getting started. After I get going I rather enjoy it.

It is somewhat similar to the experience I had when I was a 12-year-old boy up in Ontario. One spring, early in April when there was still some snow on the ground, old Stony Creek that ran by our school went on a rampage due to heavy rains. The boys dared two of us fellows who were supposed to be the best swimmers, to jump into the raging torrent as it raced through the old **swimmin' hole.** We accepted the dare but stood on the bank, shivering for a few moments before plunging into what we supposed would be icy water. To our surprise, the water was not so cold as we thought it would be and we enjoyed the experience.

And so, this writing business isn't too bad after I once jump into it.

A Mistake I Made

During a recent mild spell of weather I visited my apiaries near Medina. In one yard I found a colony that had died. The bees had formed a cluster in the combs of a super placed on a two-story hive. Apparently, this super had contained some honey last fall but the bees, during the winter, had consumed the honey and starved to death, the empty combs being filled with dead bees. It was a sad sight. Perhaps some of you readers have had a similar experience.

The upper story, commonly called the food chamber, should be quite well filled with honey in the fall. The winter cluster will usually form near the front of the hive, above the hive entrance and below combs of honey so that the bees can have easy access to it. As the winter progresses the cluster moves upward slowly, the upper portion of the cluster covering some honey and the lower portion empty cells. This emphasizes the importance of having an abundance of honey in the combs above the winter cluster, in order that colonies may not starve.

J. H. Fretz, Bedminster, Pa., giving his back-lot apiary a check up.

Feeding Sugar Syrup During December and February

In one of my yards I have a single-story colony that was below par in strength and needed some additional food last fall. I did not have extra combs of honey to feed this colony so decided to feed thick sugar syrup. Such feeding should have been done during October but I was busy—at least, that is my alibi. I fed this colony a ten-pound pail of thick sugar syrup December 1st and the bees had taken the syrup when I examined the colony on Christmas Day. Another pail of syrup was put on and the bees took it down in less than two months. Some mild spells of weather permitted the bees to break their cluster in order to take the syrup.

During the last week in February I found two colonies in one yard that seemed rather light in weight. I fed them each a ten-pound pail of sugar syrup and they took it down in less than ten days. The pails of syrup were inverted over the holes in the inner covers and empty supers were placed on top of the inner covers and under the outer covers to protect the pails of syrup. I mention this experience of feeding syrup because some may think that feeding syrup during winter months is impossible. The weather has to be mild enough to permit the bees

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to take the syrup. I do not recommend winter feeding of syrup, except as an emergency measure.

Doing the Right Things at the Right Times

IF ALL OF US beekeepers did this in managing our bees, we would have little to worry about. However, it is one thing to talk about doing the right things at the right times, and still another matter to actually do them. It was Shakespeare who said, "If to do were as easy as to know what to do, chapels had been churches and poor mens' cottages princes' palaces".

Some beekeepers who do not apply intelligent apiary management fail to get good crops of honey, then wonder why. In the majority of instances this is due to beekeepers not giving bees enough to eat. They take away too much surplus honey and leave their bees on starvation rations. The poor bees did their part. The owner of the bees failed to do his part.

The Importance of Ample Stores

During the spring months a colony of bees must have an adequate amount of honey, also pollen, for maximum brood rearing. There should, of course, be good combs in the brood chamber of each hive. By good combs, we mean combs that consist mainly of worker cells.

During cool spells of weather in the spring bees may not be able to visit nectar and pollen plants, consequently, there must be an ample amount of food in each hive for the bees to continue brood rearing. It has been said that bees require approximately one comb of honey to produce one comb of brood and one pound of pollen to produce one pound of bees.

When the weather is warm and spring nectar plants are plentiful, bees may store a considerable amount of honey. Such a honey flow helps to stimulate brood rearing. However, if the weather is cold it may be necessary to feed the bees combs of honey or sugar syrup if the supply of honey in the hives gives out.

It is preferable to wait until the weather is reasonably warm, with the mercury above 65 degrees F., to remove combs from hives for examination. It is well also to select a day when bees are flying well.

One needs a bee smoker, a hive tool, and a bee veil. Bee gloves are not absolutely essential but they do come in handy if bees become cross or difficult to handle. Some beekeepers say they never use gloves or veils. I wear gloves to keep the propolis off my hands. It is well to wear a bee veil, for it is then possible to proceed with handling the bees with no fear of being stung on the face. A sting near the eye or **inside of the nose** is extremely unpleasant and painful.

The bee smoker should be well lighted before putting on the bee veil, especially if it is a cotton veil which is easily burned by the flames from the smoker while being lighted.

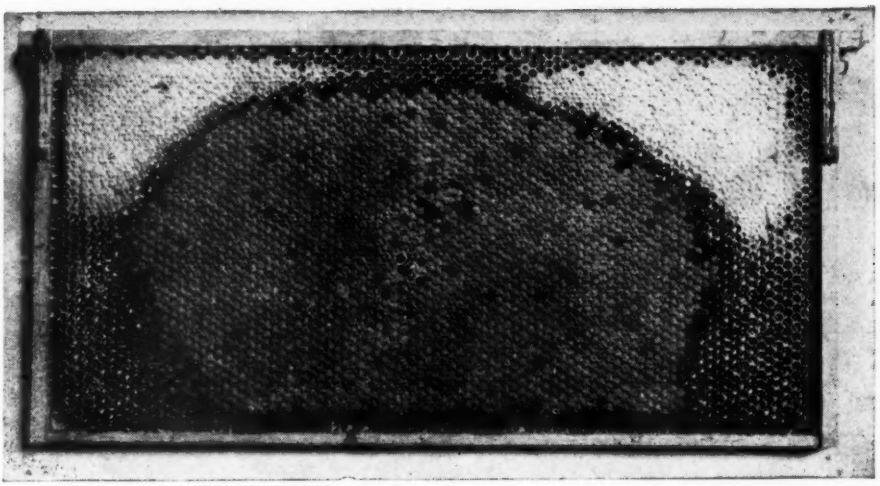
A Little Trick in Lighting a Smoker

There are different kinds of smoker fuel. Greasy waste from a machine shop makes some of the best smoker fuel we have ever used. It is very easily lighted. Old burlap sacks rolled tightly and cut with an axe into chunks long enough to fit into the barrel of a smoker work very well. When using this material, it is an advantage to have a newspaper handy. Light a small piece of paper, drop it to the bottom of the smoker, then lower a piece of burlap over the flame, and keep pumping the smoker until the burlap is well lighted.

Work at the Side of the Hive

WHEN OPENING a hive, stand to one side, preferably in a position where the sun shines over your shoulder, making it possible to see the bottoms of the cells in the combs. If the hive has an outer cover, remove it, then insert your hive tool under one corner of the inner cover and blow some smoke through the small opening. Wait a few seconds, then apply more smoke over the tops of the frames, but not too much.

To remove the first frame, push the hive tool down between the end bars of the nearest frame and the side of the hive and pry all the frames over to the opposite side. Next, separate the nearest frame from the adjacent one and remove it carefully. **Do not**



A nice comb containing sealed brood, and honey in upper corner.

make any quick moves. After examining the comb, stand it on end at the front corner of the hive in such a position that it will not obstruct the hive entrance. This is important because if the queen should be on this comb that is removed and she should decide to leave it, she could easily crawl into the hive entrance. If the removed comb were placed at the rear corner of the hive, instead of at the front corner, the queen might be lost by crawling away in the grass.

The next comb should be removed and examined, then placed in the hive at the nearest side. The remaining combs should be examined in like manner and placed tight up against combs in the hive already examined. Before placing the first comb removed back into the hive, all the frames in the hive should be pushed over to the far side to make room for the first frame that was removed. This helps to prevent killing bees.

In manipulating double brood chamber or food chamber colonies, the upper chamber after being examined, should be lifted off and placed at the rear of the hive on the outer inverted telescope cover. This procedure avoids killing the bees as would occur if this upper brood chamber were placed on a flat surface or the top of an outer cover.

What You Should Find Inside of the Hive

In the latitude of Northern Ohio a normal colony during late April should have brood in from four to six combs. Farther South, colonies have reached full strength and in some southern states a considerable amount of surplus honey has been harvested.

The combs on the sides near the walls of the hive should contain some sealed honey. The combs in the center of the brood chamber should have eggs and brood in all stages, unsealed and sealed, as well as honey in the upper portions of the combs. Cells adjacent to the brood will contain pollen of various colors. Balls of pollen may be seen on the legs of worker bees. This pollen is placed in the cells of the combs by the bees to be used as larval food. Fresh nectar may be seen glistening in the cells.

There are three kinds of cells—worker, drone, and queen. The worker cells are about a fifth of an inch in diameter. The drone cells are about a quarter of an inch in diameter, and are usually found in the lower portion of the combs and are easily detected because they project somewhat beyond the general surface of the worker cells. Drone cells look like the ends of small bullets.

Queen cells appear before a swarm issues and are usually built along the lower edges of the combs and are easily found. Instead of being horizontal, as are worker and drone cells, they are vertical in position, resembling peanut shells in appearance and size.

(Continued on page 255)

Let's freeze them

MRS. BENJ. NIELSEN
Aurora, Nebraska

Freeze those honey cookies.
—Photo courtesy Kellogg Company.

IS THE cooky jar at your house always empty? It's really hard to keep ahead, even keep up, with small fry appetites! For that matter teen-agers and slightly above seem possessed of that insatiable sweet tooth, too, especially when it comes to honey cookies. So some rainy day, or some day when you are feeling extra ambitious, bake several batches, place a few in the cooky jar as usual, to lull suspicion, then pack the rest in freezer bags, as shown in the accompanying photo, and pop 'em in the freezer.

The following have been tested for freezing qualities. Excellent flavor and good, chewy texture, these cookies should suit every member of the family.

Honey Chocolate Drops

Two squares unsweetened chocolate, 1 cup sifted flour, 1 teaspoon baking powder, ¼ teaspoon baking soda, ¼ teaspoon salt, ½ cup chopped nutmeats. ⅓ cup butter, ½ cup brown sugar, ⅓ cup honey, 1 egg, ½ cup buttermilk or sour milk, ½ cup ready-to-eat bran, and ½ teaspoon vanilla.

Melt chocolate over hot but not boiling water. Sift together flour, baking powder, soda, and salt; mix in nutmeats. Blend butter, sugar and honey; add egg and cooled melted chocolate and beat well. Stir in buttermilk, bran, and vanilla. Add sifted dry ingredients; beat well. Drop by teaspoonfuls onto greased baking sheets. Bake in moderate oven, 375 degrees F., about 15 minutes. Yield: 2½ dozen cookies, 2¼ inches in diameter.

Peanut Butter Honey Crisps

Four cups cornflakes, 1 cup butter, ½ cup peanut butter, ⅓ cup honey, ½ cup brown sugar, 1 egg, 1 teaspoon vanilla, 1½ cups sifted flour, and shelled whole peanuts.

Crush cornflakes into fine crumbs. Blend butter and peanut butter; blend in honey and brown sugar. Add egg and vanilla and beat well. Stir in flour, mixing thoroughly. Shape dough into small balls; roll in cornflakes crumbs. Place on greased baking sheets. Press one-half peanut into each ball. Bake in moderate oven, 350 degrees F. about 15 minutes. Yield: about 4 dozen cookies, 2 inches in diameter.

Pep Honeys

One cup butter, 1 cup sugar, ½ cup honey, 2 eggs, ¼ cup warm water, 2 cups sifted flour, 1 teaspoon baking soda, 1½ teaspoons ginger, 3 cups whole wheat flakes, and 1 cup chopped nutmeats.

Beat butter until creamy; blend in sugar, honey, eggs and warm water. Sift together flour, soda, and ginger; add to first mixture with cereal and nutmeats. Mix well. Drop by teaspoonfuls onto greased baking sheets, about two inches apart. Bake in moderately hot oven, 400 degrees F. about 10 minutes. Yield: 6 to 7 dozen cookies, about 3 inches in diameter.

Honey Date Bars

Two eggs, ¾ cup honey, ½ cup sifted flour, 1 teaspoon baking powder, ¼ teaspoon salt, ½ cup ready-to-eat bran, 1 cup cut dates, and ½ cup chopped nutmeats.

Beat eggs until thick; beat in honey, a little at a time. Sift together flour, baking powder, and salt; stir in bran, dates, and nutmeats. Add to first mixture and beat well. Spread batter ½-inch thick in greased 9 x 9-inch pan. Bake in moderate oven, 375 degrees F. about 25 minutes. Cut into bars while warm and sprinkle with confectioner's sugar. If desired serve as a pudding with whipped cream. Yield: 18 bars, 3 x 1½ inches.

Bee Facts

(A Digest of Scientific Research)

Edited by Walter Barth

Red Clover Pollination

"THE LENGTH of the honeybee's tongue is no handicap in the act of pollinating red clover, because the sexual parts of the flower are at the top and the tongue is not used in transferring the pollen from flower to flower." So reported A. W. Woodrow of the Bureau of Entomology of the U. S. Department of Agriculture.

"In visiting the red clover flower the honeybee approaches over the keel and wings and forces her head down between the standard petals and keel with tongue outstretched, apparently in search of nectar. Pollen is deposited on the posterior part of the head, where it is carried to other flowers.

"Most of the honeybees visiting red clover blossoms collected nectar. The behavior of the bee in visiting the flower suggests that pollen collection may be accidental."

Woodrow, A. W. Pollination of the Red Clover Flower by the Honey Bee. J. Econ. Ent. 45:(6):1028. Dec. 1952.

Oldest Reference to Honey?

THE OLDEST fragment of medical literature ever unearthed—with a reference to honey—now reposes in the University Museum of the University of Pennsylvania: a note of more than a dozen recipes for drugs, salves, and ointments jotted down 4,000 years ago by a Sumerian physician. Only recently has this been revealed through a partial translation of the Sumerian tablet.

The tablet is about four by six inches in size, and was found by an expedition to Nippur, Iraq. Casts of this Nippur medical tablet may be obtained by sending $3.50 plus 63 cents postage for packaging and shipping to the Sales Department, University Museum, 33rd and Spruce Streets, Philadelphia 4, Pa.

Now it is clear that in 2100 or 2000 B. C. the recipes included such pharmaceutical standbys as cassia, asafetida, thyme, HONEY, and other items.

Here is a literal translation of one prescription:

"Grind to a powder river dust and (word destroyed on tablet), then knead it in water and HONEY, and let (plain) oil and hot cedar oil be spread over it."

Pfizer "Spectrum", J. Am. Medical Assoc. May 1, 1954. Vol. 155, pg. 26.

Wax Eating Bird.

HONEY-GUIDES, cousins of the woodpeckers, make up a small family of 11 species, nine of which are found in central and south Africa. All appear to eat and digest beeswax, but only two species are known to lead man and animals to bees' nests. The Greater Honey-Guide (**Indicator indicator**) is the subject of this paper. It is between a sparrow and starling in size, does not possess showy plumage, and, like European cuckoos and American cowbirds, it is parasitic in its nesting habits. Its liking for beeswax has been known to lead it to eat altar candles.

Research is underway to determine the anabelic process whereby the bird is able to break down and extract nourishment from beeswax in the hope that results will point a way to a drug capable of breaking down the waxy protective coatings of the bacilli of tuberculosis, leprosy, etc. so that the bacilli may be rendered more susceptible to destruction. In this way the bird may prove to be an aid to medical science.

Friedman, Herbert, Honey Guide: The Bird that Eats Wax. Smithsonian Institution, Washington, D. C., U.S.A., Nat. Geogr. Mag. 105: 551-60 (1954).

An Idea

While wiring brood frames, each with three wires across them, a young interested watcher said, "I suppose them's for the bees to roost on at night."—From Irish Beekeeper.

XUM

Asked & Answered

Examining Bees in the Spring

Question: How soon can I open up the hive in the spring to examine the colonies? —Virginia.

Answer: The hive can be opened and the bees examined on any warm day in the spring. In fact, it does no particular harm to open the hives and look in from the top even during the winter, if this is done on a mild day. On the other hand, it is not advisable to handle the bees any more than is necessary until they begin to work freely. Usually it is not necessary to open the hives until late in April or early in May, provided the colonies have an ample supply of honey. In fact, colonies that have an abundance of honey and sufficient room for early brood-rearing need not be examined until just before swarming time or time to put on the supers. Of course, if there is any danger of any of them running short of stores an earlier examination should be made. An abundance of stores in a food chamber is the best way to eliminate spring work in the apiary.

Dead Bees at Entrance

Question: In two of my colonies I find the entrances filled with dead bees and a pint or more around the entrance. The other hives have no dead bees to speak of. What is wrong with these colonies?—Pa.

Answer: There should not be many dead bees around the entrance of the hives in the spring, under normal conditions. It sometimes happens that some colonies go into winter with a large proportion of old bees which die off early in the winter. In such cases there will be many dead bees about the entrances after the bees have been confined to their hive for some time. When bees are flying freely the old bees usually leave the hive to die so that they are not noticed; but when the weather is too cold for them to go out they may accumulate rapidly in the hive or at the entrance in front of the hive.

Several Virgin Queens in the Hive at One Time

Question: I found several virgin queens in one of my hives. Why should these virgin queens live peacefully together in the same brood nest when their appearance and activity indicated that they were several hours old?—Connecticut.

Answer: Virgin queens do not attack and kill each other immediately upon emerging, but will sometimes remain without fighting for several hours after emerging. Usually after the first of the young queens has emerged the bees apparently hold the others prisoners within their cells or in some way prevent them from emerging, unless further swarming has been given up. It is possible that all but one of these seven virgin queens had been held prisoners in their cells until the hive was opened which disturbance caused the bees to cease their guard, thus permitting the other young queens to emerge which they will do immediately under these circumstances. These queens that have been waiting for an opportunity to emerge have the appearance of being several hours old when they crawl out of the cells.

Finding Queen in Cross Colony

Question: I have a colony of very vicious hybrids which I want to Italianize, but the difficulty is in finding the old queen. What would be the best procedure in such a case?—New York.

Answer: By choosing a time to find the queen when the bees are working well on fruit bloom or other early flowers, these bees, even though they are cross at other times, may behave quite well. If you have difficulty even under such favorable conditions, the following method may be used: Place an upper story containing a few combs (preferably dark brood combs) directly above the brood-chamber without an excluder between. Smoke at the entrance and drum on the side of the hive until most of the bees have gone up into the upper story. Now slip an excluder between the two stories, then take off the cover and drive the bees downward. This is done by shaking the bees from the combs, shaking them into the upper story above excluder, and by driving them with smoke. As the bees go down, the queen should be found on the excluder. This plan should not be used when bees are inclined to rob, since a colony treated in this way is so demoralized that it does not defend itself against robbing and might not be able to organize for defense until robbers have made a good start.

FROM Foreign LANDS

Translated and Edited by Erika Barth

Cleansing Flight.

AFTER THE bees' cleansing flight, hive entrances should be enlarged. This enables colonies to develop much faster.

Steirischer Imkerbote, Nov. 1954, pg. 237.

Are Queen Cells Sensitive?

QUEEN CELLS are most sensitive between the 11th and 14th day. During these four days the transformation from larvae to pupae takes place. The transformation itself happens within 20 minutes. However, since we do not know the exact time of this happening, it is best not to open the hive during these critical four days, since the queen is most sensitive to jolts and cold at this time.

Steirischer Imkerbote, Nov. 1954, pg. 237.

Mating of Wasps.

ACCORDING TO 50 experiments with captive wasps, Dr. Elisabeth Schulz-Langner believes mating does not take place in flight but sitting down. Males will gather around the outside of the nest. They hold the female by the back and slide down backwards. Mating takes place by wing movements in the balance position. Males do not die upon separation, but live on and are able to mate again with another female.

Steirischer Imkerbote, Dec. 1954, pg. 266.

How Fast Do Bees Fly?

DR. FRITZ LEUENBERGER has made measurements of bees in flight and reports the following speeds: A free-flying bee can fly 4 metres a second, whereas a homecoming bee will only fly 1.2 metres. On calm days bees can even fly 6 metres per second. Bees are able to move their wings around 200 times per second, but can move them as slow as 40 beats a second. Field bees can fly up to 7 km. Swarms, however, can fly even greater distances. A honey crop will be larger if the honey flow is close to the apiary, since bees do not use up as much honey for their own use as they would on long-distance flights.

Steirischer Imkerbote, Dec. 1954, pg. 266.

Choosing the Apiary Site.

THE LOCATION of colonies plays an important part in successful wintering, reports R. Couston of Scotland. Shelter from cold prevailing winds, he adds, can be provided by shrubs or wattle type fencing which generally proves better than solid wind-breaks, such as walls.

"The hives should also be exposed to as much sunlight as possible, for the danger of frost spells may be alleviated if a blink of sunlight, even if only for a few hours, may penetrate the interior of the hive and allow the cluster to move to fresh stores and may also allow bees to emerge for all important cleansing flights."

The Scottish Beekeeper. Feb. 1955. Pg. 23

Control of EFB.

TERRAMYCIN GAVE satisfactory control of European foulbrood in Alberta during 1954 according to J. W. Edmunds, Supervisor of Apiary Inspection. Several serious outbreaks of EFB were found during the summer but terramycin averted serious losses.

Edmunds recommended the feeding of one teaspoonful of terramycin (25 grams active terramycin per pound) per colony. Treatment should be repeated every two weeks until the disease disappears. In most cases two treatments are sufficient but in some cases three are necessary. A satisfactory method of application is to mix the terramycin with icing sugar (50-50) and blow the mixture into the hive with a dust gun. Two teaspoonfuls of this mixture is the recommended dosage. The Cyanogas stirrup-pump is very satisfactory for this work.

Canadian Bee Journal. Feb. 1955. Pg. 9.

XUM

From the Field of Experience

It's More Fun for Two

LES RICK, Ithaca, N. Y.

I HAVE KEPT bees for about nine years as a hobby. For the first eight years, I worked alone, not knowing anyone in the immediate area who was interested in a similar degree.

I have three daughters, but their interests seem to be more in sewing and cooking and such domestic arts. I did try to stimulate Nancy's interest at the age of five, but the stimulation caused by a bee getting up one pant leg was too much and not enduring.

So I was pleased last summer to become acquainted with Harry Tall, who had some bees which he had acquired the previous year and we began going through his 13 and my four colonies together. He lives in town and keeps his bees in a woodlot he owns located a couple miles from my home. Mine were always here at home (about an acre) until last year.

I have close neighbors. Last June, for the first time since I've had bees, mine became vicious. Even I had one eye closed by stings while cultivating in the garden several hundred feet from the bees. Since it would take several weeks to change their temperment by requeening, I decided to move them. I made arrangements with a neighboring farmer a mile or so away to put them in his woods.

My friend Harry was going to help me move them and that evening I believe he would have questioned the title of this article.

I had entrances closed and hive bodies stapled when he got here. Unknown to him, I had run short of large staples and had used some small ones for the inner cover on the top of one of the hives.

We loaded them in a trailer (without any springs) and started. All was well for the first half mile, when in the rear view mirror I saw what looked like bees flying. I stopped and found there were bees flying—angry bees. Those small staples hadn't withstood the jolts of the springless trailer.

Harry drove the rest of the way and I rode the trailer steadying the loose cover. We finally got to the woods and started to carry them to the spot I had selected—about 100 feet back in. By then it was nearly dark, but those loose bees could see well enough to get us plenty. Anyhow, my bees got moved, but I'm sure Harry will long remember that evening and I'm also sure I will always have enough large staples available, before moving bees again.

Here is Nancy ready for her first trip to help with the bees.

But that was the exception, not the rule. We spent many pleasant afternoons checking our bees, making plans for extracting our honey, which honey, by the way, failed to materialize in 1954. But there is always next year. Maybe 1955 will be one of the kind we are waiting for.

Whether or not, I'm sure Harry and I are going to have a very pleasant summer with the bees, because it's a lot more fun for two.

Bees Given a New Home

WILLIAM L. BACHMAN, Springfield, Va.

BEES HAVE always been fascinating to me though it wasn't until a few years ago that I invested in several colonies when the Army gave me an opportunity to keep them. Since that time I have been trying to learn what I can about their care and to acquire experience.

Knowing of this interest of mine, one of the sergeants on the Post came to me with the news one day late last summer that he had seen a bee tree that was "loaded" with bees. On my first free afternoon I went out to have a look and was pleased to find it as populated as he had said. They were Italians and upon examination they were well behaved—no buzzing about, but busy working the goldenrod.

The colony was in an oak tree with an entrance a little larger than a football and not over two feet above the ground. It looked made to order.

The next day I began the procedure of bringing back both the bees and the honey they had stored. First a piece of tin, in which a ¾ inch hole had been cut and a bee escape attached, was nailed over the entrance. Then over the escape a cone of window screening was fastened so that any bee in the tree would have to use the one inch hole at the end of the cone for an exit. A hive was placed in front of and facing the tree so that the end of the cone and the hive entrance were only a few inches apart. The hive contained two frames of young brood and eggs, a few frames of pollen and honey, and the rest empty drawn combs. A shallow super with sheets of foundation was placed on top because it would be sometime before I could again visit the tree.

On my next inspection, which was about four weeks later, I found eight or nine pounds of bees and a young queen laying a few eggs in a honey-clogged brood chamber. I don't know if she was the queen from the tree or from one of the hatched queen cells in the hive. At any rate, she was doing her best to get some brood reared for the coming winter. Since the story and a half was just about filled with honey I put on another shallow super with foundation I had brought along. Then I tore the tin covering and cone away from the tree and with the hive tool smeared some honey into the entrance and down into the tree. I did this to encourage the bees to rob out their old home and store it in my hive.

Two weeks later the weather had stopped the field workers from bringing in anything more and the tree looked deserted and clean. All the activity was now in my hive along with the honey. The second shallow super was about two-thirds filled and that seemed as far as the bees were going to take it. The colony was moved to my home to take it's place with the others for the winter.

Proof of the success of my "bee-tree" experience is that upon examination of the colony on a warm day in February, I found it strong, the queen laying, and promising to hold it's own as an addition to my back-lot apiary.

Those Interesting Bee Laws

ROBERT M. MEAD, Vermont Apiary Inspector

THE BEE business being what it is it seems to me that the various states must have some very unusual laws. I am submitting herewith an interesting one from Vermont in hopes that other inspectors or state apiarists will come forth with some of their beauties.

"Vt. Apiary Law 4554; Sale of diseased apiary, Penalty. The owner of an apiary, honey or appliances wherein disease exists, who sells, barters, gives away or moves, without the consent of the inspector, any diseased bees, colonies, honey or appliances or who exposes other bees to the danger of such disease or who fails to notify the inspector of the existence of such disease, shall be imprisoned not more than thirty nor less than ten days or fined not more than $50 nor less than $10."

Now if at first that don't impress you read it over several times and consider all its implications. Designed to prevent the sale of diseased bees and

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equipment it also manages to bring in a lot of other things. For instance honey. If one of our larger producers has a disease incidence of one per cent and extracts all his honey into one or two tanks could I then call the whole crop infected and prevent him from selling it? I don't intend to try it, but the law is there.

In fact, with the whole state to inspect I have always given the beekeeper every break possible in order to make the inspection service something of a service rather than an agency for vengence and destruction. Still under this law I could have most of my best friends in jail. When they find a badly diseased colony they kill it with Cyanogas, close it up, and move it inside so that the combs can be melted up and the rest disinfected or destroyed in the slack winter months. It's a good practice, done correctly, but according to this law they would have to get my permission to move it and some days I'm a hard man to find.

But of course the law has a lot of good features and I suppose when it was written it was intended to be interpreted with some slight degree of common sense. It's just so darn inclusive that if an inspector wanted to be nasty about it he probably could get himself shot before the summer was well started.

Have you a law to top this one?

Clogged Queen Excluders

CHARLES J. KOOVER, Altadena, California

IF YOUR queen excluders get clogged with propolis and wax, blame the type of excluder you are using instead of your bees.

One would expect queen excluder manufacturers to give consideration to maintaining the 5/16-inch bee space as discovered by Langstroth. Most queen excluders on the market violate this bee-space principle.

Let's look into the matter more thoroughly. Hive bodies or supers are 9 and 9/16 inches deep. Frames are 9 and 2/16 inches deep. A frame suspended in a hve body allows 5/16 inch bee space on top and 2/16 inch below.

When a zinc or unbound all-wire excluder is used there is insufficient bee space above the excluder. Bees will propolize or plug with wax any space through which they cannot pass.

When a welded wire excluder is used which is bound in a wood frame a ¼ inch space is added above and below the excluder. This makes the bee space about correct above the excluder but almost double what it should be below the excluder.

Bees will have to rear on their hindlegs to reach for the excluder wires above. They will build a bridge of combs to overcome this handicap. In either case both types of excluders are apt to be badly clogged with propolis and wax. This seriously diminishes air circulation. Furthermore cleaning clogged excluders is a nasty job.

The wood and wire, wood-frame bound excluder using 10 slats of wood alternately spaced between the wires, maintains the correct bee space above and below the excluder and will stay practically free from propolis and wax. Since there is as much space between the slats as there is between the combs air circulation is not impaired in any way. An added advantage is that the bees like to walk on wood and have less difficulty working their way through the wires.

Introducing Queens in Early Spring

JULIUS LYSNE, Stockholm, Wisconsin

BEEKEEPERS OFTEN say that they experience a great deal of difficulty about queen introduction early in May and that it is difficult to make divides. Much of the difficulty stems from the idea that the queen must be in the hive a long time before being released and that the bees only must release the queen by eating out the candy in the cage.

Here is a sure method of making divides or introducing queens late in April or early in May.

1. Prepare a screen board by covering the upper and lower surfaces surrounding the bee escape opening of the inner cover.

2. Place this screen board between the brood chamber and the food chamber. Do not waste time looking for the queen. This step should be taken about a week before the queens, to make divides, are expected to arrive. Be sure upper chamber has an entrance.

3. Four days later examine each chamber for eggs. The chamber containing unhatched eggs, of course, contains the queen.

4. Remove two or three frames of sealed brood to the chamber containing no queen. Be sure that combs removed do not have the queen.

5. Place chamber with queen on bottom board and over this place the screen board.

6. Place chamber containing two or three frames of sealed brood above this and put on outer cover.

7. When queens arrive, simply place one queen cage between two frames of sealed brood and adhering bees and leave for 36 hours.

8. After 36 hours release the queens and there will be no balling of these queens. The young bees will readily accept a queen. We now have a two-queen colony.

9. Permit queen in upper chamber to lay for at least a week and then the old queen may be killed and the screen board removed.

10. If it is desired to make divides, the old queen may be set aside on a separate stand a week or ten days after the young queens begin to lay. If it is desired to operate the colony as a two-queen colony, c o n f i n e the old queen to the lower chamber with an excluder. This system of queen introduction really works.

A 4-H Honey Baking Contest

E. H. ADEE, Sutherland, Nebraska

THIS CONTEST will be open to all 4-H members carrying a food-preparation project. First, second, third, and fourth prizes will be awarded in each of the five classes. The best over-all exhibitor will be crowned Honey Queen and will r e c e i v e a cash award of $10.00. The second place over-all exhibitor will receive $5.00, and the third exhibitor, $3.00.

To be eligible for the grand prize an exhibitor must enter at least three classes. The grand prize winners will be determined by total points earned. Each first place will count four points, second place three points, third p'ace two points, and fourth place one po'nt.

The Sutherland Apiaries, produce s of "Sun Sweet Honey", are sponsoring and awarding the prizes for the Lincoln County (Nebraska) Contest. A two-pound jar of "Sun Sweet Honey" will be supplied to each exhibitor entering at least three classes. The honey will be distributed at the County Extension Office.

We followed the rule here in this County that if an exhibit merits it, it is given a place ribbon, so we had a great many second, third, and fourth places to pay for. The recipe books given were the best honey recipe books available from the American Honey Institute. We furnished all recipes to all contestants through the Extension Office.

Premium		' rst	Second	Third	Fourth
a. Date Nut Bread (1 loaf)		$1.00	$ .75	$ .50	Ribbon
b. Honey Fudge Cake or Spice Cake Frosted		1.00	.75	.50	Ribbon
c. Honey Oatmeal Cookies	(6)	1.00	.75	.50	Ribbon
d. Honey Custard (two cups)		1.00	.75	.50	Ribbon
e. Poster of uses of Honey		1.00	.75	.50	Ribbon

Just News

The **Middlesex County Beekeepers' Association** (Mass.) will hold its final indoor meeting on April 30, at 6:30 P.M., at the Massachusetts Experimental Field Station in Waltham. At this meeting the Association will install a package of Italian honey bees in a new hive. This hive will become the "Club Hive" and will be taken to each outdoor meeting during the spring and summer months, and the progress of the hive will be noted at each meeting. At the end of the season in September the hive will be given to some lucky member. The "Club Hive" is watched with interest all summer by all the members, and is of great help to new beekeepers who can compare the progress of their own hives with that of the "Club Hive".—L. C. Proctor, Sec.

The regular meeting of the **Southern Tier Beekeeping Association** will be held Tuesday, April 12, at 8 P.M. in the Reynolds salesroom, 25-27 Sturges St., Binghamton, N. Y., with a short demonstration and a question box. A picture, "The Pollination of Alfalfa" will be shown. Coffee and doughnuts will be served.—H. B. Webb, Sec.

The **35th Annual Short Course for Iowa beekeepers** will be offered by Iowa State College on May 10 and 11. The sessions will be held as usual in the Memorial Union. Prof. E. C. Martin, of Michigan State College, will be the guest speaker.—F. B. Paddock, Extension Apiarist.

A new honeybee 16mm. movie called "The Honeybee: A Social Insect", in color or black and white, is now available from Coronet Films, Coronet Building, Chicago 1, Illinois. This six-minute film, designed as an educational science film for intermediate high school students, was narrated by Orlando Park, Ph.D., Professor of Biology, Northwestern University.

Summary: Honeybees are seen as a typical example of social insects in that: (1) they cooperate with each other; (2) there is a division of labor among them; and (3) they live together in a common community. While observing these characteristics, the film studies the activities of the honeybees, their life-cycle of complete metamorphosis, and the values of the honeybee to man.

This film can be rented from Coronet Films. A color copy is available for purchase at $50.00, and a black and white copy for $27.50. Beekeepers attending the recent national bee meeting in Chicago will remember that this film was shown after the banquet.

F. C. Erkel, Rockford, Minn. a beekeeper for 70 years, died recently at the age of 87.

Death of Massachusetts Beekeeper. Fred E. Chalett, former deputy apiary inspector of the state of Massachusetts, died on February 30th as a result of injuries resulting from an accident in a saw mill. Fred was well known to many beekeepers throughout the state. He was an exceedingly capable inspector and was well liked by the beekeepers. In late years, he had been forced to give up his work as an inspector due to the pressure of other work. However, he maintained his interests in bees and in beekeepers. He attended beekeeping meetings and his contributions were notable. Fred was a clear thinker, a leader in many fields of endeavor. Massachusetts beekeepers have lost a loyal supporter and those who knew Fred will miss his genial good humor and his friendship.—F. R. Shaw, University of Mass.

The **Worcester County Beekeepers' Association** is sponsoring a beginners beekeeping program at the Worcester Natural History Museum, during the evenings of April 2, 9, 16, and 23. Good speakers will present timely topics.

The **Hampden County Beekeepers' Association** will hold its last supper meeting of the season on April 15, at 7:00 P.M. at the Hampden County Improvement League Building, 1499 Memorial Avenue, West Springfield, Massachusetts.

A 90-minute program of movies, in-

cluding "Bees for Hire", "The Pollination of Alfalfa", "The Honey Industry", and "Spring Blossoms" will be presented following the supper.—George F. Katsuranis, Secretary.

The April meeting of **Midwestern Beekeepers' Association,** will be held at Jackson County Courthouse, Independence, Mo., on April 17th at 2:30 P.M.—Mrs. William Brite, Sec.

Annual Meeting of the **Rhode Island Beekeepers' Association** will be held Saturday, April 30, 1955 at 6:30 p.m. at the Plymouth-Union Congregational Church, 1014 Broad St., Providence. Speaker will be Mrs. M. Louise Yates.

New Hampshire Meeting.—As one of our series of five garden meetings being sponsored by the Hillsboro County Extension Service, we are going to have a session on beekeeping. Prof. J. R. Hepler, University of New Hampshire Extension Horticulturist, will discuss "Beekeeping for Beginners", and Henry Holt, from Manchester will discuss " Supplies Needed to Get Started with Bees." The meeting will be held in the Milford Community House, Milford, N. H., on April 5th at 8 p.m. —Perley D. Colby, Assoc. County Agricultural Agent.

Honey Nutritive Test Developed.—A new test to help indicate the nutritive level of honey has brought a German researcher to the University of California campus at Davis.

Herwarth Duisberg, director of the Honey Research Institute in Bremen, spent last week conferring with food technologists on the test, which is more accurate than methods now used in Germany.

Nutrition-concious Germans import about half of California's yearly crop as an important food source.

The test, which measures the amount of the enzyme diastase in honey, was worked out by graduate student John E. Schade at Davis. The amount of heat-sensitive diastase in honey is a good indication of whether honey has been subjected to high temperatures during storage or shipment overseas. Heat lowers the nutritive value of honey by destroying a reported component that inhibits growth of certain bacteria.

Duisberg's visit to the U. S. is sponsored by the California Honey Advisory Board. He also has visited honey producing and packaging areas in California.

Honey of a Pitcher! He Really Jars 'Em.—Vernon Taylor, 22, a former baseball pitcher for Providence (R. I.) Bible College, hurled a strike at a masked bandit in Denver, Colorado recently. The young baseball fan felled the gunman with a jar of honey after the man had robbed a grocery clerk of $100. Police jailed the suspect after hospital treatment for head bruises.

Answers to "How Many Can You Identify?" on page 221

Top photo. Left to right: (1) **Walter T. Kelley,** Editor of MODERN BEEKEEPING magazine and author of "How to Raise Queens". (2) **R. L. Sloan.** We don't expect you to know this one for he isn't a beekeeper, but is a friend of beekeeping. (3) **Here is the first repeat. George H. Rea.** See the January issue of Gleanings for full information. (4) **Gladstone H. Cale.** Editor of the AMERICAN BEE JOURNAL and contributor to "The Hive and the Honey Bee". (5) **Mossom John Deyell,** Editor of GLEANINGS IN BEE CULTURE. Co-Editor of the current edition of "ABC & XYZ of Bee Culture", and manager of the Root Company apiaries for 25 years. Lower left photo: **Dr. Roger A. Morse,** formerly Assistant in Apiculture at Cornell University; now Entomologist on the State Plant Board of Florida at Gainesville. Noted authority on honey wines and mead. Lower right: **Walter Barth,** Associate Editor and Circulation Manager of Gleanings. Formerly deputy Apiary Inspector of New York State. Currently revising "500 Answers to Bee Questions" and "ABC and XYZ of Bee Culture".

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American Honey Institute News Notes

HARRIETT M. GRACE, Director
Commercial State Bank Building, Madison 3, Wisconsin

LET BEEKEEPERS beware! Honey for Breakfast Week is going to be upon you before you can blink twice. It starts, you know, on Easter Sunday morning and lasts for the entire week.

This is the golden opportunity that must not slip through your fingers. For during this Week the American Honey Institute puts on an extra spurt of promotional activity, sending special releases to newspapers and radio and television stations, pairing honey off with other foods that look appetizing on a spring-time menu, sending honey leaflets on breakfast uses to all of our many contacts. You, the honey man, must take advantage of this.

How? By making sure that your markets are all well supplied with your own brand of honey. By doing a little extra local promoting of your own. And by talking about Honey for Breakfast Week whenever you get the chance.

Honey has grown to be such a basic part of your life that perhaps you overlook some of its most obvious uses. We would like to give you a short refresher course on the uses of honey in the morning that you might use in the next few weeks in your local advertisements of air plugs.

Most simple of ideas are these: Pour honey over your breakfast cereal as a sweetener. Use it in your morning coffee. Float your pancakes or French toast in it. Or sweeten your morning fruit with a teaspoonful.

These honey uses may sound downright childish to you who has used honey all of your life. But they are not. It is these simple ideas that have never dawned on most folks, and yet went far to encourage the honey habit. So point them out, over and over again in your ads; they take up little copy room, but sell a lot of honey!

Now for a few fancier uses, for the honey man who will give a honey recipe leaflet away during Honey for Breakfast Week. (This idea we wholeheartedly recommend, for a recipe leaflet is a proven way to attract a customer and we have several designed especially for the use of Honey for Breakfast.)

Make your own breakfast sweet rolls this easy way: Roll out your favorite baking powder biscuit mix ¼ inch thick on a floured board. Brush with melted butter or margarine, spread with honey and sprinkle with cinnamon and finely chopped nuts. Roll up like a jelly roll. Then cut into pieces ¾ inch thick and bake 15 to 20 minutes in a hot oven (450 degrees). This wouldn't take the late-rising cook very long to make!

Arrange orange sections in a circle on an attractive breakfast plate. In the middle of the plate place a tiny paper cup of warmed honey. This is a simple idea but an effective one.

Honey butter is an "oldie" to you, but a refreshing new treat for a lot of folks. Equal parts of honey and butter make it. It can be stored in the refrigerator, and it is good on toast, rolls, pancakes, or any of the morning breads.

DON'T FORGET to tell folks about honey eggnog for cooked or prepared cereals. This is an excellent way to get children to eat eggs. Beat two eggs well, gradually add 3 tablespoons honey and 2 cups milk. Blend and sprinkle with a little nutmeg. Pour this over the cereal.

Or serve baked pears for a special Sunday breakfast during Honey for Breakfast Week. Arrange fresh pears that have been washed, cored, and halved in a greased baking dish. Fill the cavities with honey, add a dash of cinnamon and a wedge of orange to each pear. Bake in a moderate oven until tender. You can do this the night before and have them all ready to eat.

Or if you are having waffles for breakfast why not try orange waffles? Add 1 tablespoon grated orange peel to your favorite waffle batter, bake as usual, and serve topped with orange slices and plenty of honey.

These honey for breakfast hints are only a few that are to be found in our special Honey for Breakfast Week folders, **Honey for Breakfast, Honey to**

(Continued on page 251)

Buy and Sell

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate: 15c per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month preceding publication.

HONEY FOR SALE

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. The Hubbard Apiaries, Onsted, Michigan.

IOWA honey, one can or truck loads. Russell D. Smalley, Beaver, Iowa.

CLOVER extracted honey in sixties. Abram Brubaker, Lancaster, Pa., Rt. 2.

Fancy grade gallberry tupelo chunk comb, 5 lbs. $7.00, 2½ lbs. $7.50, volume discounts. Valdosta Honey Co., Valdosta, Ga.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We can not guarantee honey buyers' financial responsibility, and advise all beekeepers to sell for cash only or on C.O.D. terms except where the buyer has thoroughly established his credit with the seller.

CASH for your comb honey and all types extracted. Send sample and best price. Buckeye Honey Co., 3930 No. High St., Columbus 14, Ohio.

CASH for Beeswax. Write as to quantity and we will quote price. Muench-Kreuzer Candle Co., Inc., Syracuse, N. Y.

HONEY WANTED — All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 2613 South Yates Ave., Los Angeles 22, California.

WRITE FOR Shipping tags and quotations on rendered beeswax. We buy from one pound up and if you have over 25 pounds let us work it into foundation for you at a 25 per cent saving. Walter T. Kelley Co., Clarkson, Kentucky.

HONEY WANTED, all grades in 60's. Mail samples, advise quantity, best price. A. I Root Company of Syracuse, 1112-14 E. Erie Blvd., Syracuse, N. Y.

WANTED — White extracted or comb honey. Send sample. Millersport Honey Co., Millersport, Ohio.

WANTED—Light amber-clover and fall-flowers honey. Cloverdale Honey Company, Fredonia, N. Y.

BEST CASH DEAL for your honey (any grade) and beeswax. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

BEESWAX WANTED. Highest prices paid in cash or trade for bee supplies. The A. I. Root Co., Medina, Ohio, Council Bluffs, Iowa, San Antonio, Texas.

HONEY WANTED—Extra white, white, and light amber in 60's. Send sample and quote price. Cash paid. Clearbrook Honey Farms, Clearbrook, Minnesota.

WANTED—All grades of extracted honey. Send sample and price. Deer Creek Honey Farms, London, Ohio.

WANTED—Honey in 60's. Send sample and price. Lloyd E. Allen, Tipton, Mich.

WE ARE PAYING top prices on beeswax and honey shipped to one of our plants. Sioux Honey Assn., Lima, Ohio; Rogers, Texas; Anaheim, Calif.; Tacoma, Wash., and Sioux City, Iowa.

FOR SALE

WRITE FOR CATALOG — Quality Bee supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies and Comb Foundation. Onsted, Michigan.

THE BIGGEST BEE SUPPLY Catalog published (64 pages) free for the asking. Listing many items not found in other Catalogs. No agents—buy direct and save 20%. WALTER T. KELLEY CO., CLARKSON, KENTUCKY.

FOR SALE — New heart cypress 10-frame bottom boards. K. D., 10 or more, $1.00 each; 50 or more, 90 cents each, 100 or more, 85 cents each. One nailed up sample postpaid, $1.25. Fred L. Poole, Elizabethtown, Rt. 2, Box 67, No. Car.

NOW AVAILABLE, Fumigil for control of Nosema disease in bees. Write for prices and circular by Abbott's Laboratories. PRAIRIE VIEW HONEY CO., 12303 12th Street, Detroit 6, Michigan.

FOR SALE — About 1000 comb honey supers for 8 and 10 frame hives. They are complete with inventory at $1.00 each. C. M. Thomsen, P. O. Box 706, Pomona, Calif.

COMB FOUNDATION PLANT OF THE East—that's WAX WORKERS, 1330 Slaterville Road, ITHACA, NEW YORK.

FOR SALE—8-frame Root equipment for 700-colony apiary. Write for details to E. H. Wadleigh, Monte Vista, Colo.

FOR SALE—50 complete 10-frame metal-covered hives, $3.00 each, also section supers. Luke Aswegan, Stewartville, Minn.

FOR SALE—Bargains in new and used bee supplies and equipment. R. H. Ploeger, 19371 Greenview Road, Detroit 19, Mich.

Extractor, Woodman 50-frame, gear honey pump, 18 10-frame colonies in dovetailed supers, 200 deep 10-frame supers, mitered ends, in fair condition, 40 cents each. Location, North Western part of Ohio. Chester Kintner, Alvordton, Ohio.

FOR SALE—75 hive bodies, 150 shallow supers with drawn combs, 75 covers, 75 bottom boards. John Ellis, Newfield Road, Torrington, Conn.

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FOR SALE—Quantity of good new and used ten-frame hive bodies. Some with wired frames and foundation. Two large honey tanks. Some good winter packing cases. Ray Wilcox, Odessa, N. Y.

TWO HONEY MIXING AND STORAGE TANKS. Closed, double jacketed, enamel lined with agitator. 1,200 and 5,000 pound capacity. A. I. Root Company, Council Bluffs, Iowa.

FOR SALE—New detachable zipper veil and zipper bee suit with zipper wrists and ankles added; also books. Half price. Mrs. Earl Emmons, Rt. 5, St. Johns, Mich.

BEES AND QUEENS FOR SALE

We use all possible care in accepting advertisements but we cannot be held responsible in case disease occurs among bees sold or if dissatisfaction occurs. We suggest that prospective buyers ask for a certificate of inspection as a matter of precaution.

ITALIANS—Packages, Queens. Martz, Rt. 2, Box 846, Vacaville, California.

ITALIAN queens, $1.25 postpaid. 2-lbs. bees and queen, $4.25; 3-lbs. bees and queen, $5.00, express collect. Dadant Starline Hybrid. "The Wonder Workers", 25c per queen additional. For parcel post, add postage 6 pounds and 7 pounds. S. J. Head, Crossett, Arkansas.

THE NORMA ROY APIARY Italian Bees, 3 pounds with untested queen, $3.25; 4 pounds with queen, $3.75. Live delivery and a health certificate with shipment. Book your order now. No down payment. Norma E. Roy & Son, Hessmer, La.

PACKAGE BEES, QUEENS: Prolific, gentle, and disease free Italians. Parcel Post, express, or truck. Circular. Crenshaw County Apiaries, Rutledge, Ala.

CAUCASIANS — Very hardy, gentle, long-lived, good workers. Personally raised laying queens, $1.10 each. Ready about April 18. Fred Brock, McDonald, Tenn.

Dark Italian Queens, 600-pound strain, bred for production, $1.00. With 2 pounds of bees, $2.85; with 3 pounds of bees, $3.70. Henry Loehr, Caldwell, Texas.

CAUCASIANS, 2- lb. pkg., $3.00; 3-lb. pkg., $4.00. Untested queens, $1.00 each; 100, $75.00. Lewis & Tillery Bee Company, Greenville, Ala.

FOR SALE — 30 colonies bees fully equipped, ten-frame, disease unknown. Honey tank; automatic sling. Charles Thompson, R. 3, Falmouth, Ky.

Bring or send shipping cages. Will supply bees after May 15, small lots 75c lb., volume lots 65c lb. Queen with packages 90c. A. V. Dowling, Valdosta, Ga.

Three-banded Italian bees and queens. Our regular strain and the Dadant's Starline Hybrids. Untested queens, 1 to 25, $1.20; 25 to 100, $1.10; 100 up, $1.00 each. Package bees, 2-lb. with queen, $3.50; 3-lb. with queen, $4.50. Packages shipped from No. Carolina. For Dadant's Starline Hybrids add 30c per queen. Alamance Bee Company, LaBelle, Fla.

THREE-BAND Italian bees and queens. 3-lbs. with queen, $4.70; 5-lbs., $6.70. Shipped prepaid. Queens, $1.00. Luther Pickett, Efland, N. C.

100 ten-frame colonies, state certified Italians, in excellent condition. A. V. Dowling, Valdosta, Ga.

HONEY WANTED
Carloads and less than carloads. Mail sample and best prices in all grades.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

WEAVER'S
CAUCASIAN BEES & QUEENS
Our prices with new cages

	Queens	2-lb. w/q	3-lb. w/q
1 to 9	$1.25	$3.50	$4.50
10 to 48	1.15	3.40	4.40
49 to 100	1.05	3.25	4.25

Prompt shipment — young laying queens — full weight — young bees. State health certificate with each order. Deduct 20 cents a package for bees in clean used cages.

Shipments made by express; your truck by prearrangement. Small orders go cheaper by parcel post. For further information write us.

HOWARD WEAVER, Navasota, Texas

Package Bees & Queens
Quality & Service
C. F. KOEHNEN & SONS
Glenn, California

J. E. WING & SONS
42 Years Continuous Service
Italian Package Bees and Queens
Our Specialty
Knights Landing, Calif.

QUEENS ITALIANS

	1-24	24-99	100-up
2-lb. pkg. w/q	$3.00	$2.90	$2.85
3-lb. pkg. w/q	4.00	3.90	3.85
Nice large queens	.95	.90	.85

Send us your order of 1 or 1000
MITCHELL'S APIARIES
Bunkie, La.

HONEY LABELS
Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

QUALITY BEES DEPENDABLE SERVICE

NOW READY. Send us your rush orders — you can depend on them when wanted. Full weight, safe arrival, health certificate, and satisfaction.

33 Years as Shippers.

— PRICES —	1-11	12-100
2-lb. pkg. with queen	$3.25	$3.00
3-lb. pkg. with queen	4.00	3.75
Untested queens	1.00	.90
Tested queens	2.00	1.75

Package bees are shipped express F.O.B. If wanted shipped parcel post, add postage.

NORMAN BROS. APIARIES
P. O. Box 42 Ramer, Alabama

GRAY CAUCASIANS

30 years of selective breeding. They are gentle, prolific, and excellent honey producers.

Package Bees with Queens
April 5th to June 1st.

	2-lb.	3-lb.
1 to 49	$3.50	$4.50
50 up	3.25	4.25

Shipped Via Express Collect or Parcel Post. Let us figure your parcel post rates. Book your order NOW.

BOLLING BEE CO.
Bolling, Ala.

Booking orders now. Over 30 years a shipper. Send for Free Circulars.

BLUE BONNET APIARIES
Weslaco, Texas

1955 QUEEN BEES

3-Banded Italians

1-9 ..... $1.10 each
10 or more ..... 1.00 each

Queens ready about April 5th.

Geo. W. Moore
Shasta, Shasta Co., California

Good Italian Queens
In season
White Pine Bee Farms
Rockton, Pa.

FOR SALE—About 50 colonies Italian bees. Inspected. Karl Rude, Mexico, N. Y.

SEEDS

HONEY PLANTS our specialty. Catalog on request. Pellett Gardens, Atlantic, Iowa.

MISCELLANEOUS

Bargains in new or used honey cans or Root Supplies for cash or honey. Buckey Honey Company, 3930 N. High St., Columbus 14, Ohio.

POLLEN PIES — Supplement lack of natural pollen and stimulates brood rearing when adverse conditions occur. Accepted by leading apiaries. Hive fed. Compounded to order—always fresh. One pound Pollen Pies, 75c; Mailed postpaid. One pound rears 4,500 bees. Increase your hive population and honey production. Order today. Easton's Beeteria, Box 99, Sidney, New York.

TRY NATIVE HONEY — Printed on white 58M caps. Makes sales $2.00 per 100 F.O.B. B. W. Richardson, 303 Lincoln St., Worcester 5, Mass.

Run a Spare-Time Greeting Card and Gift Shop at home. Show friends samples of our new 1955 All-Occasion Greeting Cards and Gifts. Take their orders and earn up to 100% profit. No experience necessary. Costs nothing to try. Write today for samples on approval. Regal Greetings, Dept. 223, Ferndale, Michigan.

HELP WANTED

WANTED — two men to work in our packing plant and apiaries. Excellent wages, bonus, other advantages. Schultz Honey Farms, Ripon, Wisconsin.

SUPPLIES

NOW READY — Your copy of the BIGGEST MONEY SAVING CATALOG of Quality Bee Supplies at savings up to 25%. Prompt shipment—100% satisfaction guaranteed. WRITE TODAY! MONDENG MFG. CO., MINNEAPOLIS 5, MINN.

MAGAZINES

Know interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English by the Bhupen Apiaries (Himalayas), Ramgarrh Dist. Naini Tal, U. P. India, or available through them. Subs. Rs9/ or 15 shillings or $2.25 yearly. Sample copy post free for Rs1/6/, or s2/6, or 40 cents (International Money Order). Payment in mint postage stamps of your country accepted.

ARCHIVE of BEE SCIENCE (Archive fur Bienenkunde), oldest scientific, independent bee journal in the world. Select feature material gives lasting theoretical and practical knowledge. Sample copies available. Two large 1953 editions for the low price of DM 5.50. Biene-Verlag (Bee Publishers), Lindau (B), Postcheck Karlsruhe 5581, Germany.

BEE WORLD, the international journal of the Bee Research Association, published monthly, contains the latest research reports on bees and beekeeping. With Apicultural Abstracts it cost $3.00 per annum. Apicultural Abstracts only $1.75 per annum from the Hon. Subscription Secretary, Bee Research Association, 10 Barnett Wood Lane, ASHTEAD, Surrey, England.

ALWAYS BEST AHEAD OF THE REST

BERRY'S

"Old Reliable" Strain Italian Bees

STANDARD OF THE BEEKEEPING PROFESSION

Definitely, the **PREFERRED** stock of **MAJOR SUCCESSFUL HONEY PRODUCERS** the **WORLD** over. **INSURE** your crop with young, vigorous, producing, **DEPENDABLE BERRY BEES.** Sixty years of **SELECT** breeding.

PRICES APRIL 1st THROUGH MAY 10th

Package Bees with Queens and Individual Queens

	Queens	2-lb. pkg.	3-lb. pkg.	4-lb. pkg.	5-lb. pkg.
1-24	$1.15	$3.50	$4.50	$5.50	$6.50
25-99	1.10	3.40	4.40	5.40	6.40
100-499 ...	1.05	3.30	4.30	5.30	6.30
500-UP ...	1.00	3.25	4.25	5.25	6.25

For prices on queenless packages deduct price of queen.

M. C. BERRY & SON P.O. BOX 684 MONTGOMERY, ALA.

PACKAGE BEES . . . "GULF BREEZE" ITALIAN QUEENS

We have increased our colonies by a large margin to take care of RUSH orders and those booked in advance. Cheaper packages and queens are available, but you must figure on QUALITY and SERVICE, otherwise late delivery will wipe out your initial savings. TRUCKS loaded in a hurry, as our capacity is large.

PRICES:

Quantity	Queens	2-lb. pkg. w/q	3-lb. pkg. w/q	4-lb. pkg. w/q
1-24	$1.25	$3.50	$4.40	$5.40
25-99	1.15	3.35	4.25	5.25
100-up	1.10	3.25	4.15	5.15

BESSONET BEE COMPANY Donaldsonville, La.

PACKAGE BEES & QUEENS

"Italians"

Wilbanks offers you tested stock proven for honey producing ability and easy handling. Satisfied customers through years assure you of the greatest value here.

— PRICES —

	1-9	10-up	parcel post ship. wt.
2-lb. pkg. with young laying queen	$3.25	$3.00	7 lbs.
3-lb. pkg. with young laying queen	4.25	4.00	8 lbs.
4-lb. pkg. with young laying queen	5.25	5.00	10 lbs.
Extra Queens	1.10	1.00	Postpaid

Shipments by Express, Parcel Post or your Truck.
Package Bees F.O.B. — Include Postage for Parcel Post Shipments

QUALITY DOES NOT COST — IT PAYS

THE WILBANKS APIARIES Claxton, Georgia

YORK'S PACKAGE BEES and QUEENS for 1 9 5 5

The Preference of Leading Honey Producers

QUALITY: Your Choice of two Outstanding Strains, Dadant Starlines or our own Italians, both Strains are **Quality Bred.**

SERVICE: 10,000 colonies to load trucks with speed and still maintain express and parcel post schedules. Also, 10,000 nuclei to insure ample supply of vigorous young laying queens for shipment when they are needed.

Reg. U.S. Pat. Off.

PROGRESS: Fumagillin-fed grafting yards, mating yards, and package syrup to maintain your package morale until brood emerges. A bonus in every package.

PRICES with Italian Queens:	1-24	25-99	100 up
2-lb.	$3.75	$3.50	$3.25
3-lb.	4.75	4.50	4.25
4-lb.	5.75	5.50	5.25
5-lb.	6.75	6.50	6.25
Queens	1.25	1.15	1.05

Above prices are for/or with our regular line Italians. For DADANT STARLINE 4-WAY HYBRIDS, add 25c each additional. For TESTED QUEENS, add $1.00 each additional. For QUEENLESS PACKAGES, deduct $1.00 per package.

Shipments are made by express, parcel post, or your truck. Our facilities for truck loading are among the best. In most cases your load is on the way the same day it is prepared avoiding holding over of number of packages several days until the entire load is prepared. Parcel post and express shipments handled promptly and with experience. We recommend shipment by parcel post of all shipments less than five packages. For further information, write us.

YORK BEE COMPANY Jesup, Georgia, U.S.A.

(The Universal Apiaries)

FINE ITALIAN BEES AND QUEENS

Bred by Selection and Natural Mating

NO HYBRIDS — NOTHING EXTRA TO PAY

One customer reported 400-pound average production from our bees. Said he, "It shows what good management, a good season, and **good bees** will do".

37 Years' Experience No Disease.

Live Delivery and Satisfaction Guaranteed.

Shipment by Express or Parcel Post.

SPECIAL ATTENTION to Small Orders.

1 9 5 5 PRICES

	Less than 25	Over 25
Queens of Quality (each)	$1.10	$1.00
2-lb. bees with queen	3.50	3.25
3-lb. bees with queen	4.50	4.25

J. F. McVAY

Jackson Alabama

Oueens Queens

Three Banded Italians

Experienced	Resistant
Dependable	Prolific
Quality	Gentle

State Certificate with each shipment.

QUEENS 70c any number.

Air Mail 5c extra.

HONEY BOWL APIARIES

Box 574
Bunkie, Louisiana

THE AUSTRALASIAN BEEKEEPER
The senior beekeeping journal of the Southern Hemisphere provides a complete cover of all beekeeping topics in one of the world's largest honey producing countries. Published monthly by Pender Bros. Pty. Ltd., Box 20, P. O., Maitland, 3N, N.S.W., Australia. Subscription by Bank Draft or International M. O. 18/- (approx. $2.15) per year, post free. Sample copy free on request.

The New Zealand Beekeeper
The Quarterly Magazine of the National Beekeepers' Association of New Zealand. Better Beekeeping — Better Marketing. Subscription, 8 shillings per year, payable to
THE GENERAL SECRETARY
Box 19 Foxton, New Zealand

BRITISH BEE JOURNAL
The Only WEEKLY BEE Journal in the World
Subscription $4.50 per annum payable in advance.
Keep up to Date in Beekeeping by taking out a subscription now through our agents:
Gleanings in Bee Culture
Medina, Ohio

PROTECT YOUR FUTURE. BUY YOUR SAVINGS BONDS NOW.

Read the South African Bee Journal. Published every two months. Subscription 7/6 per year to the Treasurer, P. O. Box 3306, Cape Town, South Africa.

DO YOU FIND it difficult to secure information about sheep and sheep ranching methods? The SHEEP AND GOAT RAISER reaches more sheepmen with more information on range sheep than any other magazine published. Subscription $1.00. Hotel Cactus, San Angelo, Texas.

Italians QUEENS Caucasians

2-lb. pkg. with queen	$2.60
3-lb. pkg. with queen	3.45
Queens, each	.75

CLARK'S APIARIES
Bunkie, La.

HISTORY OF BEEKEEPING

(Continued from page 218)

in mating queens in glass enclosures. Experiments conducted in the course of several years at the University of Minnesota apiary with mating virgins in a large screen cage were completely unsuccessful. Similar experiments conducted in Florida, gave several successful matings. Haydak, 1949, states that the geographical location influences the results of such experiments.

1889 A.D.—G. M. Doolittle described a complete method of queen rearing, in his "Scientific Queen Rearing". Doolittle did not claim originality for his system, but stated in the preface of his book that "he had picked it up a bit here and another there, and he refined the methods so as to make them workable." His system was so complete and worked so satisfactorily that the originators of most of the details were soon forgotten. By means of making artificial cells in large numbers, transferring the larvae to these cells, and supporting them on bars in frames hung in the hives, he made it possible to rear good queens efficiently and cheaply. Doolittle is considered the founder of commercial queen rearing.

1890 A.D.—Langstroth's "The Hive and the Honeybee," as revised by Charles Dadant, was translated and published in French.

(to be continued)

[On page 154 of Part III of this series which appeared in the March issue, the date, 1517, given in the caption beneath the illustration is incorrect. It should be 1565. This is an editorial error.—Editor.]

HOMES WANTED

For a good home we will pay good rent. That is what MERRILL'S bees can promise you, and the price is low for First Quality bees and queens. Italians only.

	1-25	25-50	50-up
2-lb. pkgs. with queens	$3.00	$2.75	$2.50
3-lb. pkgs. with queens	4.00	3.75	3.50
Untested queens	1.00	.85	.75
Tested queens (each)	2.00		

Prices are F.O.B. shipping point on bees, queens delivered by mail. If bees are wanted by mail get rate of postage from your postmaster.

2-lb. packages 7 lbs. each, crate of 3 packages 21 lbs.
3-lb. packages 9 lbs. each, crate of 3 packages 27 lbs.

Daily shipments are now going out.

MERRILL BEE COMPANY

P.O. Box 115 **State Line, Miss.**

Three-Band Italian Package Bees and Queens
and Pure Italian Three-Way D. R. Queens

Full weight, prompt shipment, young bees. State health certificate with each shipment. Live arrival guaranteed. Replacement or refund made promptly upon receipt of bad order from your express agent.

1955 Prices
Each Package with a Young Laying Queen

Lots of	2-lb.	3-lb.	4-lb.	5-lb.
1 - 29	$3.25	$4.00	$4.75	$5.50
30 -100	3.00	3.75	4.50	5.25
100-up, each	2.80	3.50	4.25	5.00

Tested Queens $2.00 each **Untested Queens $1.00 each**

For introduced queens, add $1.00 per package. If queenless bees are wanted, deduct $1.00 from the price of each package.

JACKSON APIARIES **FUNSTON, GEORGIA** **U. S. A.**

Brazos Valley Apiaries
Cameron, Texas

Italians

Brazos Valley Apiaries
Cameron, Texas

Package Bees and Queens

By Express or Parcel Post Extensive Experience in Loading Out Trucks

	1 pkg.	2 or more
2 lbs. bees with young queen	$3.25 each	$3.00 each
3 lbs. bees with young queen	4.25 each	4.00 each

Nearing a half century in the same place, same business, under the same name, is my record. My motto: "I expect to do business with you again."

H. E. Graham Cameron, Texas

Light Italians

A top-producing strain that is more gentle and easy to handle.

	1-24	25-99	100-up
2-lb. pkg. w/q.	$3.25	$3.00	$2.80
3-lb. pkg. w/q.	4.00	3.75	3.50

Queens $1.00 ea. postpaid.

Add 75c per pound for larger packages.

Packages are F.O.B. here.

Sunrise Apiaries

Petal, Mississippi

FLOWERS' QUALITY ITALIANS

That will stand the test for honey gatherers; gentle; prolific; queens bred from hives making 300 pounds honey; guaranteed mated and laying; health certificate; full weight; prompt shipment; live delivery guaranteed. Shipment by express, truck, or parcel post. Include postage for parcel post shipments.

Packages with Young Laying Queens			
Quantity	1-24	25-100	101 up
2-lb. pkg.	$3.25	$3.00	$2.80
3-lb. pkg.	4.00	3.75	3.50
4-lb. pkg.	4.75	4.40	4.25
5-lb. pkg.	5.50	5.25	5.00
Queens	.75	.75	.65

Tested queens, $1.50. All queens shipped airmail delivery.

OUR QUEEN OUTPUT IS DOUBLE FROM LAST YEAR SO LET US HAVE YOUR ORDERS IF YOU WANT THEM AT ONCE.

For further information, write us.

FLOWERS BEE COMPANY

Jesup, Ga. U. S. A.

USE OF POLLEN SUPPLEMENTS AND SUBSTITUTES

(Continued from page 202)

tain colonies during the season when it is being collected abundantly. This pollen is dried and stored for the coming year. The pollen is fed along with soybean flour and sugar syrup in the ratio of three parts flour to one of pollen made into a stiff batter.

The substitute usually takes the formula six parts soybean flour to one (maybe as much as four) parts of brewers yeast. This mixture has a 2:1 sugar syrup stirred into it until it becomes a stiff batter.

The supplement or substitute is fed to the bees in pattie form, laid out on waxed paper and inverted over the frames in contact with the brood nest. Weak colonies need only a small cake the size of the palm of the hand, or smaller for nuclei. Large colonies may take cakes weighing a pound or more to start with and as much as two to three pounds a week as brood rearing increases. The cakes should be consumed in a week or ten days. When sufficient natural pollen is available, bees may not touch the cakes. Then, too, some may not use it the first time it is fed, but will start with the second or third round. The colonies that use the cakes are the ones that need it most and will be the ones to build up the biggest populations. They will more than pay for the failure of their sister colonies.

There may be need for this form of stimulative feeding soon after brood rearing starts in mid-winter. When cold weather prevents the early pollen-producing plants from blooming until a month or six weeks after normal, there is bound to be a need for pollen supplement or substitute. It is one way the beekeeper can make up to the bees for Nature's failure.

DARK ITALIANS

As GOOD as the BEST (Including Hybrids)

With Queens	1 to 9	10 to 50	51 & up
2 lb. pkgs.	$3.75	$3.50	$3.25
3 lb. pkgs.	4.75	4.50	4.25
Extra queens	1.20	1.10	1.05

A Commercial Breeder for 28 years.

WEAVER APIARIES **Navasota, Texas**

ADDING LIFE TO BEE EQUIPMENT

(Continued from page 211)

While shorter periods of time may be used the effectiveness of the treatment will depend mainly on the length of time the wood is permitted to soak in the preservative. However, this process is not considered to be as effective as the pressure treatment.

Any water-tight tank of sufficient strength and size to submerge the wood to be treated in the solution is satisfactory. Weights or some device to keep the wood from floating above the surface of the preservative are necessary. An opening at the bottom of the tank to drain off the preservative before or after the wood is removed is desirable.

Hot and Cold Bath Process: This method is the most effective of the non-pressure processes but it requires more equipment and work. The wood is first immersed in a tank of hot preservative for several hours and then quickly immersed in cold preservative and left in it for another period of hours or days before removal.

Pressure Treatment: Treatment of wood in strong tanks equipped for vacuum and high pressures is the best and most rapid method of securing thorough penetration and long durability. The chief disadvantage of this method is the cost of the equipment to do the work.

AMERICAN HONEY INSTITUTE NEWS NOTES

(Continued on page 242)

Start the Day Right, and **Honey and Cereals.** You can still order them from us in plenty of time for distribution in your area.

The American Honey Institute has spent many extra hours preparing specific promotion for this time. This is also the time for action on your part. Let us both push honey into the limelight April 10 to 16!

If you are taking time to read, why not read the best? Condensed to save you time. Illustrated to give you pleasure.

Modern Beekeeping
The Picture Bee Magazine
Clarkson, Kentucky

Get More Per Hive
In 1955

Use Package Bees with Island Hybrid Queens

We plan larger and better production of 4-way Hybrid queens in '55.

Place your order early for favored dates and delivery on Package Bees.

Prices with Island Hybrid Queens

	2-lb.	3-lb.
1 to 25	$3.65 ea.	$4.65 ea.
26 or more	3.40 ea.	4.40 ea.

For regular queens, deduct 25c per package. Write for prices on early Booster Bees.

"They Produce"

Rossman Apiaries
P.O. Box 133 Moultrie, Ga.
Phone: 755R

Italian Queens
75c each

Air Mail
and
Guaranteed to Please

O. K. Anderson & Son
Box 193
Coffee Springs, Ala.

QUALITY-BRED
Italian Queens
Ready March 10, 1955
$1.00 each or $10.80 per doz.
All queens shipped Air mail. Write for price on package bees delivered by truckload.
Walter D. Leverette Apiaries
P. O. Box 364 Ft. Pierce, Fla.

THREE-BANDED ITALIAN PACKAGE BEES AND QUEENS
Shipped Anywhere in United States and Canada

1955 Prices F.O.B. Hampton, S.C.	Queens (each)	2-lb. & queen	3-lb. & queen	4-lb. & queen	5-lb. & queen
1 - 24	$1.10	$3.50	$4.50	$5.50	$6.50
25 - 99	1.00	3.25	4.25	5.25	6.25
100 - up	.95	3.00	4.00	5.00	6.00

(For queenless packages deduct price of queen)

Guaranteed safe arrival
Health Certificate with each shipment
Queens clipped and painted if desired
Shipper rated in Dun & Bradstreet

TERMS: One-third with order, balance 10 days before shipment.

H. C. BRUNSON **Hampton, South Carolina**
P. O. Box 188 Phone: 2161

BETTER-BRED QUEENS **THREE-BANDED ITALIANS**

Frame after frame of smooth, even brood; super after super of honey; gentle bees; swarming cut to minimum. This is what you get when buying our Better-Bred Stock. Plenty of bees ready for April 1st shipment. Order direct from this ad at the following prices:

	Queens	2-lb. w/q	3-lb. w/q
1 to 18	$1.15	$3.25	$4.15
18 to 99	1.05	3.10	4.05
99 or more	1.00	3.00	4.00

CALVERT APIARIES **CALVERT, ALABAMA**

WILLIAMS' ITALIAN QUEENS
LARGE LEATHER COLORED
THREE-BANDED
QUALITY SUPREME
CERTIFICATE WITH EACH SHIPMENT

1 - 9 Postpaid, Airmail $1.00
10 -99 " " ..... .95
100-up " " ..... .90

DR. WILLIAMS APIARIES
115 W. Sterling Ave. Baytown, Texas

LOOK
POWER SICKLE CONVERTS TO ROTARY TILLER
Powerful self-propelled Jari with Rotary Tiller attachment tills 5" seed bed, safely cultivates right next to plants, mulches perfectly. Sturdy self-propelled Jari with sickle bar attachment cuts 36" swath thru weeds, brush, tall grass, work of six men! Other attachments: self-propelled reel mower, self-propelled snow thrower. Write for information and dealer. All products guaranteed.
jari
jari PRODUCTS, INC.
2940-V Pillsbury Avenue, Minneapolis 8, Minn.

PROTECT YOUR FUTURE. BUY YOUR SAVINGS BONDS NOW.

MORE ABOUT HANDLING BEES

(Continued from page 209)

had lost all patience with them. Accordingly I closed up the hive, and belayed it heartily with a couple of stout sticks, like a drummer beating a tattoo, until the echoes went rolling away across the countryside.

"Now," I thought, lifting the inner cover with a satisfied smile, "I have taught them a sharp lesson. They will know who is the master."

The next moment I was running for my life, resolving to drop that particular method of pacifying bees. It is probably better to requeen if you have a colony like that. Somebody once asked the most famous of all public speakers, Demosthenes, what is the chief point that the orator should keep in mind. "Action," replied he. "And what is the next most important thing?" came the question. "Action," replied Demosthenes. "And after that?" "Action," responded the great orator. Likewise it may be said that, in the handling of bees, there are three things that really matter: Gentleness comes first, gentleness second, and gentleness third.

PACKAGE BEES FOR 1955

Dadant Starline Hybrid Stock—38% Better Honey Production than the average common stock of the country (3 years' trial)—18% Better Egg-laying Ability than the average common stock of the country (4 years of trial). Results of other trials obtainable by mailing us a postal card.

GARON'S OWN 3-Banded Italian Stock improved through know-how in selecting Breeding Queens and Drone Mothers for combinableness necessary for highest honey production.

Reg. U.S. Pat. Off.

OUR PRICES:	QUEENS		Package Bees & Queens		
	Italians	Starlines			
1-24	$1.15	$1.50	$3.40	$4.35	$5.30
25-99	1.10	1.40	3.30	4.25	5.20
100-up	1.05	1.30	3.20	4.15	5.10

When Dadant Starline 4-Way Hybrid Queens are wanted with packages, add 25c extra per package.

Queens clipped and marked when desired, and air mailed at no extra cost.

GARON BEE COMPANY Donaldsonville, La.

JENSEN says:

Copious rains came during winter just passed, and spring has blossomed forth anew. Our hopes have been more than met in one of the most favorable spring seasons within our memory. Bees have responded gloriously to manipulations and we know our Faith in Providence has been justified again. The influx of advance orders is gratifying, and a healthy sign for the future of beekeeping as an industry. We are doing our utmost to meet the challenge of the evident trend by expanded facilities and efficiency.

Reg. U.S. Pat. Off.

Special Introductory Offer: On all orders for "Magnolia State" Queens, we will substitute 10% Dadant "Starline" Hybrids (or 10% of order, whichever is least) at the price of Magnolias. Clipped and Marked Free. Fumidil-B fed.

	Queens	Queens	Italians with Queens	
	"Starline" Hybrids	"Magnolias"	2-lb. pkgs.	3-lb. pkgs.
1-24	$1.50	$1.25	$3.75	$4.75
25-99	1.40	1.15	3.50	4.50
100-up	1.30	1.05	3.25	4.25

For Starline Hybrid Queens in Packages, add 25c to each.

JENSEN'S APIARIES MACON, MISS. U. S. A.

ITALIAN

Package Bees and Queens for 1955

	1-11	12 or more
2-lb. pkg. with queen	$3.25 ea.	$3.00 ea.
3-lb. pkg. with queen	4.25	4.00

Live delivery guaranteed.

GIRARDEAU APIARIES Tifton, Ga.

PACKAGE BEES ITALIAN QUEENS

Good Producers — Gentle

You will like them. Good service.

A. R. BANTA Los Molinos, Calif.

OLDEST BEE JOURNAL IN THE ENGLISH LANGUAGE

Keep up on markets, practices, scientific data, regulations and plant possibilities.

1 year, $2.00, U. S. and Canada
Foreign postage, 50c a year extra

AMERICAN BEE JOURNAL
Hamilton, Illinois

"The Australian Bee Journal"
Published by the Victorian Apiarists' Association at the beginning of each month.
Subscription 10/-per annum plus 2/6 postage to oversea countries.
Address 112 Whitehorse Rd.
Ringwood, Victoria, Australia

We Want to Buy

We want to buy beeswax delivered to the processor nearest you at 65c per pound in trade for 3 pound packages with a young laying Bambi Brand queen in each package at $4.00 each. Extra, young laying Bambi Brand queens $1.00 each. Write us for details. Credit extended to reputable and financially responsible beekeepers.

SOUTHERN APIARIES & SUPPLIES COMPANY
Chatom, Alabama

CAUCASIAN & CARNIOLANS

Start the New Year with young queens and be assured of plenty of bees when the honey flow starts. Caucasians or Carniolans build up rapidly, build white combs, and are gentlest of all races of bees.

Untested queens ..... $1.20 ea.
Foreign ..... 1.50 ea.
Discount on quantity.
Order early to be sure of queens, ready March 10th.

W. D. REAMS
Box 87 LaBelle, Florida

Healthy Italian Bees & Queens
Write for 1955 Prices
Georgia Bee & Honey Apiaries
P. O. Box 312 Hortense, Ga.

JOHN DAVIS QUEENS

We ship until November 1 and fall is the right time to requeen. Order now and be sure. $1.00 each, any number.

LITTLE'S APIARIES
Shelbyville, Box 122, Tenn.

VET-STREP AND TM-10

(Continued from page 206)

We have used TM-10 dust in some areas where we expected the presence of American foulbrood. So far we have reason to believe that its effectiveness against this disease is considerable. But we have never treated an AFB colony with terramycin and cannot vouch for its value in this respect.

Both in California where we raise our queens, and here in Colorado where we produce honey we have treated some really bad cases of EFB and have found that both streptomycin and terramycin are capable of effecting cures that are all but miraculous. Among the hundreds of colonies treated with TM-10 in the spring of 1954 not one damaging case of EFB developed in a territory where 25 per cent of the colonies were wiped out just two years before.

The important thing does not seem to be which of the two materials is used, nor how, nor how much for that matter, but that **some** reaches each colony at fairly consistant intervals. Treatment should be begun before the colony experiences any serious loss of brood, and continued to a point near the beginning of the main honey flow. With that practice followed it does not seem that European foulbrood need longer be a threat to honey production.

Italian Queens

EUGENE WALKER
Rt. 2, Box 207
Live Oak, California

ITALIAN BEES AND QUEENS

2-lb. pkg. with queen $2.80
3-lb. pkg. with queen 3.40
4-lb. pkg. with queen 4.15
5-lb. pkg. with queen 4.95
Extra queens, each, ... .85

Live delivery guaranteed and health certificate with each shipment.

GASPARD BEE CO.
Hessmer, Louisiana

ITALIAN BEES & QUEENS

2-lbs. & queen $2.75
3-lbs. & queen 3.50

Prompt shipment.
Satisfaction guaranteed.

A. J. HOOK Eutaw, Ala.

A TALK TO BEEKEEPERS

(Continued from page 231)

Installing Package Bees

If packages are received when the weather is hot, they should be placed in a cool dark room. If the weather is cold, place the packages in a room not warmer than 70 degrees F. until ready to put into hives.

Install bees late in the evening, if possible, to avoid having bees drift from one hive to another. Have hives ready on permanent stands, each containing five frames with drawn combs or frames with full sheets of foundation. The empty space in each hive is for the package of bees until the bees have left the shipping cage.

The queen in her cage, also the can of syrup, is lifted out of the shipping cage. The queen cage is placed between the top bars of two frames. The bees will leave the shipping cage and cluster on the combs near the queen. The frames that were removed to make room for the shipping cage should be placed back in each hive after bees have left the shipping cage.

Be sure to give the bees plenty of sugar syrup continuously until nectar is available in quantity. The hive entrances should be reduced to small dimensions, approximately 3 x ⅜ inches, until warm weather arrives.

BEES and QUEENS

The rearing of good Italian queens and bees is our only business.

45 years experience

	1-9	10-48	49-up
2-lb. pkg. w/q	$3.60	$3.35	$3.25
Queens	1.25	1.15	1.10

Add 90c per pound for larger packages. Young laying queens. Full weight. Young bees. Health certificate with each shipment. Prompt service.

W. E. PLANT
Rt. 2, Hattiesburg, Miss.

CAUCASIAN or ITALIAN
Package Bees and Queens

Bees gentle to work with, less swarming, good producers, health certificate, and live arrival guaranteed are just a few things you get when your requirements are sent to me.

PRICES ARE:

Quantity	1-25	25-50	50-100
2-lb. pkg. w/q	$3.00	$2.90	$2.85
3-lb. pkg. w/q	3.90	3.80	3.75
4-lb. pkg. w/q	4.85	4.75	4.65
5-lb. pkg. w/q	5.80	5.70	5.50
Queens	1.05	1.00	.95

FARRIS HOMAN
Shannon, Miss.

THREE-BANDED
Italian Bees and Queens

	Queens	2-lb. w/q	3-lb. w/q
1-24	$1.00	$3.00	$4.00
25-99	.90	2.85	3.85
100-up	.75	2.75	3.75

For queenless package deduct price of queen. Shipments made by parcel post or express.

Lucedale Apiaries
Lucedale, Miss.

HARPER'S FAMOUS
High Quality Italian
QUEENS & PACKAGE BEES

Lots of	Queens	2-lbs.	3-lbs.	4-lbs.	5-lbs.
1-11	$1.10	$3.25	$4.25	$5.15	$5.95
12-up	1.00	3.00	4.00	4.85	5.60

All Queens sent Air Mail. Package bees sent Express Collect or Parcel Post when prepaid by customer. Parcel Post is much cheaper and has proven to be very satisfactory. Live Arrival Guaranteed. Please send orders in early.

Carlus T. Harper
New Brockton, Ala.

19 Italians 55
Package Bees and Queens
Good Producers
Dependable Service
Joe Pencin
Box 517 Davis, Calif.

Look for this Sign
When you Want
QUALITY AT LOW COST

Trade Mk. Reg.
U. S. Pat. Off.

KELLEY — "The Bee Man"

BEES and QUEENS

Three-banded Italian bees and KELLEY'S ISLAND improved hybrid queens direct from our own farm. Shipments start April 1st, express or parcel post shipment. Thousands of extra queens.

	Kelley Island Queens	2-lb. bees & K. I. queen	3-lb. bees & K. I. queen
1-24	$1.10 air mail	$3.50	$4.50
25-99	1.05 air mail	3.25	4.25
100-up	.95 air mail	3.00	4.00

* Last month our advertisement got mixed up—these are our actual selling prices. They are net—no discounts.

THE WALTER T. KELLEY CO., Clarkson, Ky.

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B & Z LIBRARY

Gleanings in BEE CULTURE

May 1955

OHIO STATE UNIVERSITY
MAY 3 1955

Dadant's CRIMP-WIRED FOUNDATION

The Choice Of Expert Beekeepers

In heat or cold the hooks will hold
The crimped wires radiate shoulders of strength
Wires of special steel for greatest support
Accurate embedding so bees use every inch
Made only from pure beeswax
Refined for utmost cleanliness
Brilliant, natural color
Accepted at once by the bees
Cell walls a guide to perfect comb
Milled to exact measures
All cells just alike
Every sheet the same
Carefully and rigidly inspected
Securely and safely wrapped

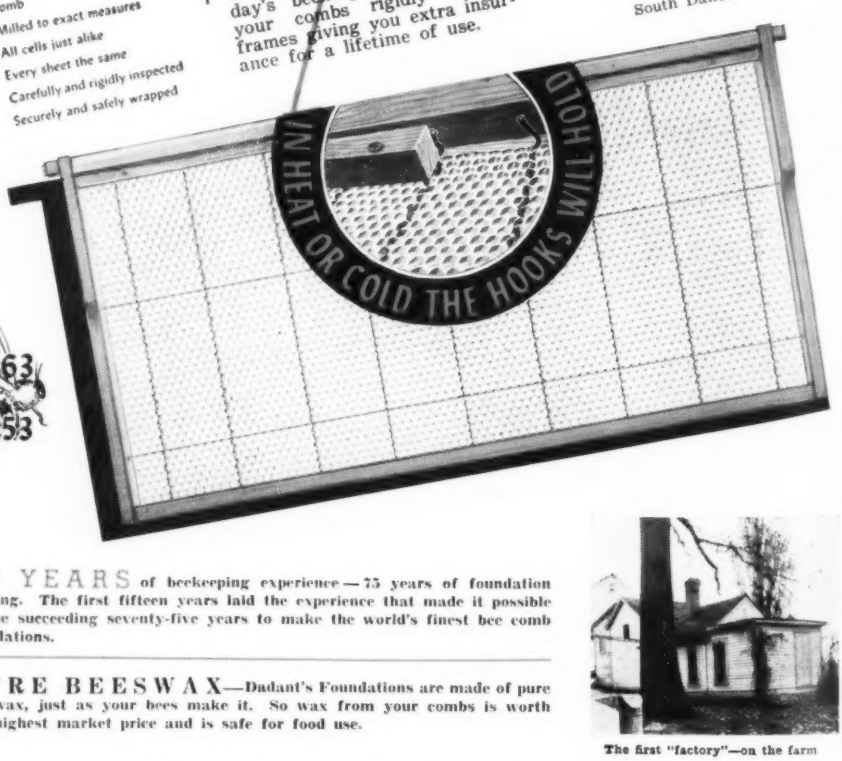
The Hooks WILL HOLD

You can't pull them out. Laboratory tested for holding power, these hooks, in high heat and with a fifty-pound load, never did pull out. They are steel hooks, bent exactly by special machines that took years to produce. They are your extra guarantee of safety for the heavy demands of today's beekeeping. They hold your combs rigidly in the frames giving you extra insurance for a lifetime of use.

Gives You LIFETIME COMBS

I was one of the first to use Dadant's Crimp-wired Foundation and I soon found the combs sometimes pulled out at the top bar. I put the first hooks in by bending the extended wires by hand and I told the Dadants about it. It took a long time for them to do the job by machine but, they did it. I got some of the first of the foundation with hooks and it has always given me combs you just cannot beat.

L. A. Syverud
Aberdeen
South Dakota



1863 1953

90 YEARS of beekeeping experience — 75 years of foundation making. The first fifteen years laid the experience that made it possible in the succeeding seventy-five years to make the world's finest bee comb foundations.

PURE BEESWAX—Dadant's Foundations are made of pure beeswax, just as your bees make it. So wax from your combs is worth the highest market price and is safe for food use.

The first "factory"—on the farm

Hamilton, Illinois **Dadant & Sons, Inc.** Paris, Texas